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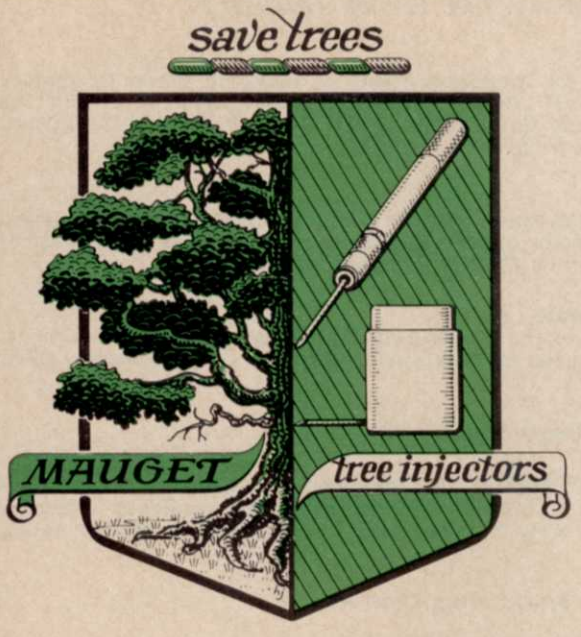

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WEEDS TREES and TURF®

Volume 12, No. 12 December, 1973

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"Serving The Green Industry"

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A big problem for managers today is knowing when to replace vehicles. Robert F. Smith, equipment superintendent within the Bureau of Transportation, City of Los Angeles looks in detail into the situation and proposes a formula.

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In short order, the meter will be the basic unit of linear measure. E. L. Fisher, director of service, Kohler Co. examines the impact of the metric system on the small engine industry.

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Green Industry Council Formed In Cleveland 24
An industry first. Coordination of activities of Green Industry organizations to meet a united goal is the objective of this newly formed group.

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65 Speakers, 5 Business Areas, 5 Days 28
The Ohio Short Course has lead in popularity for several years among many Green Industry members. Here's a preview of the 1974 meeting.

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Turfgrass researchers continue to find new and exciting strains of desirable turfgrasses. Penncross creeping bentgrass is the result of a three plant crossing. W. Scott Lamb reports on this variety.

PULL OUT SECTION
1974 Managers Guide To Equipment And Supplies

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The Cover

A.M. Panic Hour is the time when equipment managers learn the true meaning of preventive maintenance. Our cover shows the North Hollywood maintenance facility of the Bureau of Transportation, City of Los Angeles. The article on Fleet Management begins on page 12 in this issue.

THE COVER — Managers Guide

Equipment and supplies for the Green Industry are highly complex. The 1974 Managers Guide To Equipment And Supplies captures some of the action in this montage. Included are: a section of Certain-Teed pipe, Edwards sprayer mounted on a Jeep; Ford skid-steer loader with sod; Toro Whirlwind rotary mower; International Harvester flail and bell-mounted sickle cutters; and Stihl chain saw.

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PENNCROSS SUCCESS STORY CONTEST

OFFICIAL PENNCROSS STORY CONTEST ENTRY FORM

On May 22, 1972, we started construction of a new 8000 sq. ft. sod nursery here at Rancho Bernardo. It was completed on June 20, and given the final touches before seeding. Penncross Bent was chosen for several reasons, one being the success our new Executive course was having with it. The nursery was seeded on June 30, 1972, at a heavy 2½ pounds per 1000 square feet.

We watched until there was a very even green cast on the complete nursery and then, on July 11, we used a starter fertilizer. When the Penncross reached approximately ¾ of an inch we made our first cut with a ½" bench setting and continued on a daily mowing schedule until putting green height was reached.

Unbeknownst to me, some Japanese people had been watching the operation very closely. It came on with amazing speed, and sixty days from seeding we had a very good putting surface and about 4" depth on our root system. Before the sod was 90 days old we had cut and moved most of the 8000 sq. ft. to some problem greens.

This brought to my office the Japanese who had been watching the sod nursery since its conception. They asked what I had done in construction and what grass was used. They also asked if I thought I could repeat the nursery operation in Osaka, Japan? Sounds good! The only catches being: they wanted the recommendations by phone and mail and the greens had to be ready for play in early November for an American Pro Tournament. It was now August 10, 1972. I contacted my friend who had supplied the fertilizers and seed, and work began.

Fertilizer samples were sent to Japan to be inspected by the Japanese government. Fertilizer spreaders were shipped air freight, the government approved shipment of fertilizers and the move was on. The greens had already been roughed in and were ready for mix, final grade, and seeding.

After numerous meetings, letters, and phone calls to Osaka, the greens were seeded at 2 pounds per 1000 sq. ft. on September 1. The Penncross came up as predicted, was fertilized as planned, cut as soon as it was ready and progress was almost identical to our nursery here at Rancho Bernardo. They were ready by tournament time in mid-November 1972, and I'm told "better than any of the other greens at Ikeda Country Club." My new friends are very happy that they went with Penncross and claim to have the "Showplace" of Osaka, Japan.

This was all done gratis, but it was a very fulfilling experiment. Mr. Araki, President of Ikeda Country Club, flew to San Diego to give his personal thanks to my friend and myself They favored us with some small gifts, took us out for a lovely dinner and we talked of our success with their new greens and their plans for more.

They are a very grateful people and I'm satisfied that my choice of Penncross is not only working for me in Rancho Bernardo, California, but also for my new friends in Osaka, Japan.

Gary A. Silor

Signed: GARY A. SILOR

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Meeting the issues confronting the Green Industry continues as the greatest challenge facing every reader of this magazine. Issues such as FEPCA, OSHA, pollutions of noise, air, water, and energy drains must become centerstage in the thinking of Green Industry leaders. Indeed, solutions to these issues can only be found through concentrated cooperation by every individual.

Will we sit idly by while uninformed politicians decide who in the industry may spray environmental protection chemicals and which ones and when? Will we have to justify to a judge the need to operate a chain saw or a chipper in a residential area during a specific hour of the day? Have we as an industry blindly accepted the Occupational Safety and Health Act as being too big, too all encompassing and too dominant as a law to lobby, legislate and change into a workable, acceptable body of rules?

Not caring, not being concerned enough in plotting the course of the Green Industry in the future denotes only our interest in the material things of the present.

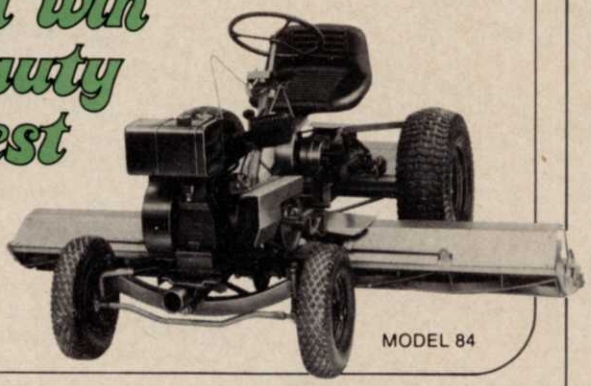
On the positive side, certain accomplishments by Green Industry organizations must be recognized as significant achievements. In this issue, for example, leading organizations and associations have listed three major objectives met by their members this year. They have also published what they consider as goals to achieve in 1974.

Likewise, in November, leaders representing major Green Industry organizations met in Cleveland to discuss formation of a Green Industry Council. This group would act as the united voice for the industry in matters concerning the Federal Environmental Pesticide Control Act and other Federal legislation which has industry-wide implications.

We believe that efforts by Green Industry organizations have been worthy. Their action denotes action. Member involvement has created a magnetic attraction to involve the non-doer. But in a larger sense, the prime goal of every organization in this dynamic industry must be towards increased participation in meeting the great issues confronting the industry as a whole.

We are a cohesive industry, built out of the needs and wants of individuals. The issues of 1974 demand more attention by every individual. Complacency must be replaced by effective action. Our strength in the future will derive from a closer identification of what we may lose should our tools be taken away.

A workhorse won't win a beauty contest



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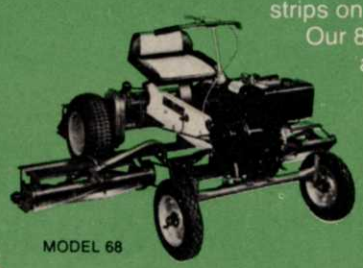

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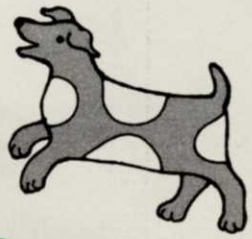

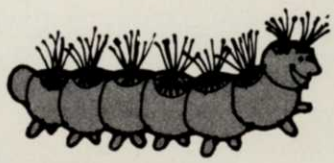

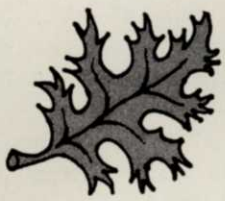

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Government News / Business

If you've been caught by the breath of OSHA and can't cough up money to pay the fine, take heart. An interagency agreement between OSHA and the Small Business Administration (SBA) has been set up. Purpose is to provide long-term loans to small businesses for compliance with OSHA.

Further word on Agrico Chemical Company. Sale by The Williams Companies, Tulsa, Okla. of Agrico to Lebanon Chemical Corporation, Lebanon, Pa. included only the Turf and Garden Products Division. The entire Agrico Company was not sold, as erroneously reported in the October issue of WTT. According to R. L. Balser of Agrico, the sale amounted to about a $3 million deal, less than one percent of the total Agrico operation. Included in the purchase was the Turf and Garden Products plant at Danville, Ill. This brings to two the number of manufacturing plants operated by Lebanon Chemical and the result will be faster service to dealers. Added Note: Lebanon Chemical has now farmed out the operation to a newly created subsidiary, The Bishop Company. It too is based in Lebanon, Pa.

The noose of the Federal Environmental Pesticide Control Act (FEPCA) is starting to tighten. Provisions built into the time-release act have already begun to take affect. Now it is the pesticide producers. A producer who ships environmental protection chemicals in interstate commerce must register with EPA by December 24, 1973. This pre-Christmas present requires companies to submit annual reports on production, distribution and sales. For intrastate producers, the registration date is October 21, 1974.

Secretary of Agriculture Earl L. Butz may be given the legal machinery necessary to authorize use of DDT. A bill which would require EPA to clear DDT for use in cases where the Secretary declares that a temporary emergency exists has now passed the House Agricultural Committee. A number of additional approvals are needed yet, but it is conceivable that use of DDT on gypsy moth and tussock moth as well as other pest infestations could be in order in 1974.

Claims of insufficient fuel supply response in the natural gas, coal, nuclear power and petroleum industry as the cause of the energy crisis have been refuted by Robert L. Sansom, EPA assistant administrator for air and water programs. Nay, he says. The chief obstacles "appear to have been overreliance on foreign crude, poor oil industry planning, the restrictive quota system, and overly controlled natural gas prices." He said the American consumer is the true culprit in the energy crisis. Sansom spoke to the Arlington (Va.) Rotary Club in November. He said that EPA has already granted temporary variances to emission standards for power plants. However, he stressed that no general lifting of environmental regulations are in order. EPA will not be subjected to "energy blackmail" by suppliers who are not willing to come forward and explain why they cannot meet standards, he said.

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WTT Special News Report

The Fertilizer Outlook

Allocation, price controls, foreign demand, availability of components, tight supply, and capacity to produce have drastically changed the fertilizer market in the past 18 months. The forecast for 1974 is not overly encouraging. USDA economists predict a shortage of 1.7 million tons of nitrogen and phosphate fertilizer; other sources closer to the problem forecast the shortage closer to 4 million tons.

A number of factors are responsible for the current situation. 1. About 25 million of 40 million set-aside acres were turned back into crop production this past year. Even more is scheduled for the plow in 1974. 2. Fertilizer manufacturers experienced strong foreign demand. This came about by devaluation of the U. S. dollar and Phase IV price controls. Foreign purchasers realized a comparative advantage and scooped up ton after ton at relative "bargain barn" prices.

3. Capacity to produce phosphoric acid has fallen short of realized demands for the past year or two. New production facilities have not come on-stream as expected. Raw phosphate supplies appear to be adequate to meet anticipated needs; the problem is in manufacturing the end products of ammonium phosphate and concentrated superphosphate. 4. Ammonia production has a funeral outlook. Domestic production has been at near capacity for more than a year. To complicate the situation, curtailments of natural gas, a major component, has forced producers to limit production. This failure to provide the fertilizer industry with an ample supply of natural gas will result in profound effects on our nation's food supply, comments John J. Clarke of Collier Carbon and Chemical Corp.

The single most important factor is natural gas. Whether the Washington political machine will give fertilizer producers the needed allocation is still much in the air. Says George Osburn, sales manager, turf products, Hercules Inc., "Supply of all nitrogen products will revolve around the availability of natural gas and the availability of production capacity for ammonia as well as other nitrogens."

Currently, action is taking place on several fronts. A recent decision by the Cost of Living Council has exempted sale of fertilizer and nutrient materials in producing fertilizer from Phase IV controls. This should help. Additionally, small bulk plants, which previously had terminated fertilizer production capabilities, are being asked by Washington to start up again. Also, with the U. S. dollar stronger abroad, predictions of foot-dragging in foreign markets are to be expected.

The tendency in the past has been to bargain hunt. It's a whole new ballgame now. If it is not already too late, establish an association with a supplier; he may be your best friend in the months to come. Review what your fertilizer needs were for the past few years. Note when you ordered. Could one order made right now take care of the year's requirements? Plan your inventory, but don't stockpile in anticipation of a disaster.

A special word to commercial turfgrass managers. Plan fertilizer programs for the short-range objective. Add as your turf needs it. Split applications of nitrogen fertilizer where potential for loss is high. Irrigate carefully, to prevent excessive losses of nitrogen by leaching.

In summary, many factors have been responsible for the current situation. We are not out of fertilizer. We are short, perhaps critically short. Fertilizer manufacturers are not content with the state of affairs. Efforts have already been taken to ease the pain. A government task force is seeking to raise the priorities for natural gas feedstocks to ammonia producers. The Department of Transportation is working on shipping bottlenecks, particularly rail. Sane thinking by politicians, executives and managers plus identifying needs by planning ahead will see the Green Industry through.

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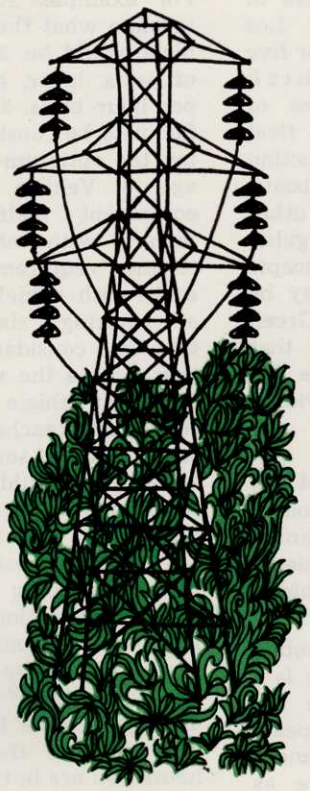

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WTT COVER STORY

FLEET

Editor's Note: Robert F. Smith is one of three equipment superintendents within the Bureau of Transportation, City of Los Angeles. He is responsible for five maintenance facilities which maintain over 2,900 pieces of equipment. Included in the fleet are cars, trucks, construction equipment, aerial buckets, boats, helicopters, tractors and other vehicles needed by Los Angeles. Many of the management concepts contained in this article may be used by firms within the Green Industry. We would hope that these concepts will provide insight into solving individual equipment problems.

ONE OF THE MOST important and difficult tasks we all have today, is the preparation of our annual budgets. This is particularly true as it relates to replacements of vehicles and equipment.

Everyone who owns an automobile or any other type vehicle today is a transportation specialist. With the little visual change in the appearance of our specialized equipment over the past few years, we as "transportation experts," tend to believe our equipment can run forever with just another set of spark plugs and tires.

Recognizing this as a problem, we must then become more "people-oriented." Our systems, charts and proposals must be aimed at those individuals who can see only the expenditure of funds to purchase the same thing we already have, not considering new designs or more efficient equipment.

The first important factor we must know is the **most economic replacement cycle.**

To demonstrate how you can program vehicle or equipment replacements, we must define and outline the situation in terms of basics. For example, 1. We need to determine what the cost of a new vehicle would be. 2. Maintenance cost of parts, labor, and overhead on a per hour basis. 3. Inflation is not a factor to be considered in determining the optimum vehicle retirement age. 4. Vehicle downtime due to equipment malfunction increases linearly with vehicle age. 5. Maintenance requirements increase linearly with vehicle age. 6. All units are working a single shift. We must take into consideration the percentage of time the vehicle is available by age of vehicle. It is a fact that as the vehicle reaches an age of five to seven years of service, a decrease in availability could occur due to the need for a major refurbishing of the unit.

Take into consideration what occurs by defining the vehicle downtime as a function of vehicle age. It is good to recognize that your maintenance staff may be able to perform a large portion of the repairs to units during off hours. But once the downtime exceeds the available man-hours you are in trouble.

Costs records portray the maintenance hours required according to the vehicle age. As each unit in your fleet increases in age, the maintenance requirements also increase proportionally. Your staffing should be compatible with your fleet size and age of equipment.

The most economical replacement cycle must be based on three main factors:

1. Replacement cost.
2. Maintenance cost.
3. Out of service cost.

The out of service cost is that portion of time for which stand-by vehicles must be provided to meet the requested availability. Considering the vehicle out of service days per year can give you a numeric ratio of stand-by units needed to provide for the out-of-service requirements depending upon the vehicle age.

Once the above data is available, it can be combined. Based on information provided, we can utilize a mathematical formula to determine vehicle replacement.

One system of replacement used by some large fleet owners today is the Formula Basis Replacement System. It is an attempt to integrate several major vehicle costs and usage data into a mathematical formula which will approximately reproduce the cost of the vehicle operation over a constant period.

Thus, two formulas, one for the vehicle under consideration for replacement and another for a comparable replacement vehicle, can lead to a meaningful comparison of actual costs involved. As an example, if the cost per mile (or per hour) to continue operating the old vehicle is greater than the cost per mile (or per hour) to buy and operate a new vehicle, then you should sell the old vehicle. This can be expressed in a mathematical equation as:

$$\text{If } \frac{A+B-C}{X} \text{ is greater than } \frac{A+E-D-W}{Y}$$

then Sell

The designation of the various letters stands for:

A — Original cost of vehicle

B — Cost of repairs needed to continue service

C — Salvage value of the vehicle after completion of service life.

D — Salvage value of new vehicle after it has reached the end of it's expected service life

E — New vehicle cost

W — Current sale value of old vehicle

MANAGEMENT

By ROBERT F. SMITH

X — Total life of old vehicle after repairs needed to continue service (life to date plus extension of life due to repairs — this may at times extend life beyond average replacement expectations).

Y — Total life of old and new vehicle (old to date plus estimated life of new vehicle)

Note: Life can be expressed in miles, hours, months or years for X and Y, but must be the same factor in both formulas.

The second important factor to know is **balancing budget replacement.** With a large fleet one of the most difficult problems faced by managers is the continued fluctuation to our budget requests resulting from differences in vehicle acquisition schedules. One year we may replace thirty units at one time and the next two years, none.

Some smaller fleets have experience and prefer a straight line depreciation so they can plan their replacements ahead.

The last factor to determine is the **most acceptable replacement costs.** Most of us have moaned for years about the fact that we had to install a new engine, a new transmission, or some other costly component just prior to ordering a new unit. Or, conversely, we have deadlined a unit rather than replace one of these major components.

I want to suggest that we have not given full consideration to our total vehicle management responsibilities by following these practices. How many man-hours could you have saved and how many additional hours of usable service could you have obtained had you replaced an engine, transmission or some other single component? Why not capture this cost savings and further reduce your budget by replacing only those items which are generally in need of replacement. For example, records indicate almost no rear-end failures. Most of the body work performed is related to the tailgate assembly. And as engine and transmission replacements are almost a routine item, why worry about them? I would suggest review of your repair records and then consider retention of those items which are routine in nature of those which have an indefinite life.

When is it best to lease rather than buy and what type lease arrangement is the most satisfactory? What is the best way to get service for small fleets (5 or 6 vehicles) if the company does not have a full time maintenance facility? These and other questions confront people in our business regularly. It would seem that one of the ways to accomplish this end would be to lease or rent. Let's look at this in some detail.

There are mainly two types of

(continued on page 84)

Equipment management means keeping abreast of new changes in Federal and state regulations. Superintendent Smith points out the new height of this chipper from the ground. OSHA and other laws have increased the safety around machines such as this.

THE METRIC SYSTEM
Its Impact On The Small Engine Industry

By E. L. FISHER
Director of Service
Kohler Company

IF you are 5 foot 10 in your stocking feet this morning, you won't be 5 foot 10 very long.

In five years, ten years, or slightly more, you will be 1 meter 78. When someone asks you how tall you are, you will answer "1 meter 78" — just as easily as you say "5 foot 10" now. On your driver's license, it will be the same — 1 meter, 78 centimeters. If you are elected President of the United States or picked up for vagrancy, the official records will show your height as 1 meter 78.

What I am really saying is **the metric system is on the way.**

Back in 1795 after the Revolutionary War, the United States considered breaking away from the English system of measurements. We were breaking away from England in many other respects. The French, our allies, were promoting a radical new system based on multiples of ten. We had already adopted a decimal coinage system, so there was strong support for the new decimal measurements referred to as the metric system.

Congress failed to act, however; and so we have drifted along using the comparatively complicated English system. How much simpler it would have been if the right decision had been made then. Metric system legislation was introduced in Congress in 1866, 1896, 1901, and many times since. Bills are now being introduced every year, and we can expect passage soon.

Actually, there is no single metric system. France originated the system in the late 1700's, but it has been modified in Germany, in Italy, in Japan, and in other countries to the point that each country has its own metric system — similar to the others but different enough to create problems.

We in this country are working with the metric countries to establish a uniform metric system called the Systeme International, or SI for short. This uniform system is basically metric, it is the one we expect to adopt, and we shall refer to it here simply as the metric system.

Probably not one of us can talk easily in terms of meters, liters, and grams. We have heard the terms. But the metric system is still a bit strange and foreign to us. In fact, it's rather disconcerting to realize that in a few years our Miss America with her "perfect 36" will be gone forever. She will be Miss America with a "perfect 91." But before your imagination starts taking off on that one, let me hasten to add that by that time we will be so metric-oriented that we will think of a "perfect 91" as wonderful, and she will not have changed one centimeter!

Within the small engine industry, we want to know how our transition to the metric system will affect us as manufacturers and distributors and how it will affect our dealers. Will the conversion be costly? Will it be difficult? Will it take much effort on our part to educate our service distributors and dealers?

Let's review the metric system briefly to see how the metric system will affect each of us in our daily lives.

Figure 1 shows some of the basic units of measurement, with comparable metric and English system designations.

Figure 1. Basic Units

UNIT	ENGLISH	METRIC
Length	Inch	Meter
Weight	Ounce	Gram
Temperature	F.	Celsius
Liquid	Quart	Liter
Pressure	PSI	Pascal

Figure 2 shows some of the conversion factors between English and metric linear measurements. This illustrates the difficult part of changing to the metric system. The conversion factors are variable because of the different multiples between inches and feet, feet and yards, etc., in our English system. The difficulty, therefore, is generated by the characteristics of our English system rather than the metric multiples.

Figure 2. Linear Relationships

ENGLISH	METRIC	CONV. FACTOR*
Inch	Millimeter	25.4
Foot	Centimeter	30.5
Yard	Meter	0.914
Mile	Kilometer	1.61

* English To Metric

Figure 3 shows how simple the metric system really is, with various multiples of ten being used whether measurement is lengths, weights, or volume. Some of the multiples are not in common usage but prefixes have been established and are, therefore, part of the system. In the case of the basic unit of length, which is the meter, the other multiples in common usage are the millimeter, centimeter, and kilometer. In the case of weights, with the gram as the basic unit, the milligram and kilogram are the other multiples in common usage.

Figure 3. Metric Multiples

Meter Basic Unit = 1

PREFIX	SYMBOL	UNITS (meters)
Kilo	K	1,000
Hecto	H	100
Deca	DA	10
Meter	(basic)	1
Deci	D	.1
Centi	C	.01
Milli	M	.001

How does the metric system affect our daily lives?

Assume that it's 20 years from now and a new day is dawning. The alarm rings, you bounce out of bed, and the first thing you do is check the thermometer. That's when you enter the metric world. The thermometer reads 10 degrees. That's 10 degrees Celsius. On the old Fahrenheit thermometers it would have been an invigorating 50 degrees.

Perhaps you are familiar with the Centigrade scale from your school

(continued on page 30)

These two fine-leafed perennial ryegrasses were cut with the same mower. The one on the right shows the fibrous "paint brush" top which is characteristic of ryegrasses. Pennfine, on the left, took a smooth, even cut because it was bred for softer, easier to cut fibers.

Pennfine: the clean-cut perennial ryegrass.

All the new fine-leafed perennial ryegrasses are beautiful. Until the mower comes along. That's the moment of truth for ryegrass. And Pennfine is the fine-leafed perennial ryegrass bred specifically for mowability. You can see the clean-cut look of Pennfine in the photo above. You'll see it in your turf, too.

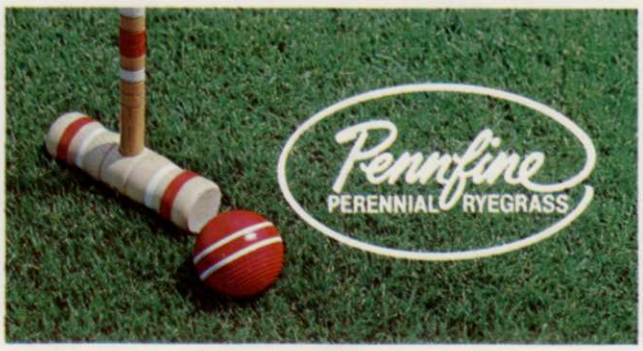
Pennfine vs. other fine-leafed ryegrasses

Developed and released by Pennsylvania State University, Pennfine is the best of the fine-leafed perennial ryegrasses. That's the finding of the trials at University Park, Pennsylvania. Among nine cultivars, Pennfine ranked first in texture, first in density, first in decumbency (low growth), first in tolerance to snowmold and leaf spot. And, of course, first in mowability.

Pennfine mows 'em down

The remarkable mowability of Pennfine — the result of breeding specifically for soft fibers — is demonstrated in the above photograph. It was also proven by the University Park trials. Over a five-year period, Pennfine averaged 8.3 (of a possible 10) in mowability. The next best score was 7.3, and the other cultivars rated considerably lower.

With the finest blade of all the fine-leafed ryegrasses tested, Pennfine is beautiful to begin with. And, because of superior mowability, it stays beautiful. It's also highly compatible with Kentucky Bluegrass, both in terms of appearance and management requirements. If you'd like more information on this clean-cut perennial ryegrass, just send in the coupon.



TO: **Pennfine Perennial Ryegrass**
P.O. Box 923, Minneapolis, Minnesota 55440

Please send me technical information on Pennfine Perennial Ryegrass. ☐ Names of Distributors. ☐

Name_____

Club or Company_____

Address_____

City_____ State_____ Zip_____

Pit Stop For Professionals

Texas Industrial Weed Control Conference Report

TRAINING in equipment use and chemical application procedures continues to be the number one need among commercial applicators. Ask any applicator or spray man, from the most sophisticated to the novice, to rank the items most desired by him in the performance of his job and the overwhelming majority will list training at the top.

Why? No one answer will suffice. The best theory is a combination of factors. Changing laws relating to application of environmental protection chemicals, new applicators coming on the scene, new chemicals on the market, growing awareness of a growing market, more up-to-date application equipment — these and others contribute as reasons applicators give. But in a larger sense, this thirst for training is indicative of an industry poised on the springboard of a newly emerged, highly technical science that demands considerably more qualification and knowledge of its people than what we've had up to now.

Commercial application of environmental protection chemicals is a prescription science where knowledge and experience command attention and where training is a prerequisite to success. Few custom applicators today would attempt to prescribe materials for vegetation control without knowing first the area to be treated and second the effect or end result of each chemical used.

Problem identification and analysis and specific treatment have been emphasized at weed conferences, applicator meetings, by university extension personnel and by chemical and equipment manufacturers. The thrust of all has been more toward specificity with a good deal of actual case study and field demonstrations.

The 8th annual Industrial Weed Control Conference held at Texas A&M University in mid-October was no exception. In two days, delegates were exposed to a barrage of topics, papers, demonstrations and panels the likes of which would educate and train a neophyte to a professional, if he could assimilate all the information.

Sponsored by the Texas Agricultural Experiment Station and the Texas Transportation Institute, this conference represents probably the only one of its kind devoted entirely to industrial weed control. This year's meeting covered the Federal Environmental Pesticide Control Act (FEPCA), aquatic weed control in Florida, OSHA, problem analysis, vegetation control on rights-of-ways, parks and lawns, brush, trees and vines, and total vegetation control.

Conference chairman Dr. Wayne G. McCully, department of range science at Texas A&M, opened the session saying that conferences of this type give us a chance to make headway in weed and brush control.

One of the early speakers was James Pumola of Region VI, Environmental Protection Agency. He reviewed the history of pesticide legislation and outlined the need for the present FEPCA. "This is the first law in which applicators must be licensed in order to apply chemicals," he said.

Pumola carefully reviewed several sections of FEPCA as they apply to applicators. "Pesticides must be classified according to restricted or general use," he said. Scheduling on licensing of applicators for the state of Texas will be established after the regulations are published on December 21. He concluded by saying that it is the intention of EPA to turn over the administration of FEPCA to the states.

Looking at a model program for Texas, Harry Whitworth of the Texas Agricultural Chemical Association told delegates that the primary program is the certification of commercial and private applicators. He said that the tests to be developed for certification "must be of sufficiency to demonstrate the ability of the person to properly apply the product for which he will be licensed."

Whitworth mentioned that currently the authority of FEPCA is at the Federal level. "Enforcement is placed at the state level," he said. "It is incumbent that the state pass an act in the next legislature." He said that help is needed in implementing this bill because environmentalists will bring much pressure on legislators.

Dr. Alva P. Burkhalter, coordinator, aquatic plant research and control, Florida Department of Natural Resources, enlightened those present with Florida's program for aquatic vegetation control. "The department has these functions:" Burkhalter said, "1. control of offenders, 2. training programs for certification of applicators, 3. regulation of plant movement, 4. research — in house and with Federal and state agencies. . . ."

He said that the state's major aquatic problems have been weed species which were introduced into Florida's waters. Water hyacinth, hydrilla, Eurasian watermilfoil, Brazilian elodea and alligatorweed were brought into the state.

Burkhalter pointed out that his state had taken decisive measures to control these aquatic weeds. Use of herbicides, mechanical weed harvesters, biological controls (insects), and herbaceous fish have been used to keep weed growth under control. He explained that a combination of biological and chemical methods appears to be better than either alone. This means that when several factors attack weed growth, the resulting damage is greater than one factor by itself. Thus, where chemicals are used to treat water hyacinth, the addition of the flea beetle enhances the weed killing action.

The opening session dealing with regulatory and legislative action pertaining to the user closed with a discussion of the Occupational Safety and Health Act by Jim Powell, assistant director, OSHA, San Antonio. OSHA deals strictly with an employee/employer relationship. It affects any employer who employs and works in interstate commerce, he said.

Powell said that in simple terms the act requires the employer to

provide a safe environment for the employee. There is no penalty for the employee, he said, only the employer. It allows the employee to make a complaint directly to OSHA without going to the employer first. Noticeably missing from the discussion was specific points as to what OSHA looks for in the no notice inspections. Powell tended to hang his speech entirely on explaining what the law was rather than telling applicators what they should do. More than one applicator commented that many of the important points that might affect his business were glossed over. It might be safe to conclude that those applicators present were given no new facts about how OSHA affects the industrial herbicide applicator.

New products were next on the program. Delegates showed much interest in Spike, an experimental herbicide from Elanco Products Company. When registration is approved by EPA, this product will be available in four and fifty pound packages. It is non-corrosive and has an LD_{50} rating of about 500 mg/kg. The product can be applied pre- or postemergence and it is active against herbaceous and woody plant species. Delegates were able to see demonstration plots of this material at the Texas A&M research annex.

Vic Jouffrey, FMC Corporation, told delegates about the John Bean highway boom. It's a boom powered by a hydraulic cylinder which can be adjusted from inside the truck. Jouffrey said that it is made with two movable sections and can be used in conjunction with any sprayer.

Another interesting approach to weed control was the Weed Zapper, a kind of giant micro-wave unit that super cooks weeds from the inside out. Larry Benson of Oceanography International Corporation, College Station, Texas described the process as one method of weed control that leaves no residual. "When the Zapper passes over, weed tissue is destroyed," he said. There has also been research conducted with the Zapper in nematode, fungus and insect control.

Field demonstration and displays of equipment and chemicals were an integral part of the conference. One product which caught the attention of delegates was Lo Drift, a spray additive which reduces the drift potential. Jack Thompson of Amchem said that it could be used in nearly every application of herbicides to reduce drift and keep the herbicide

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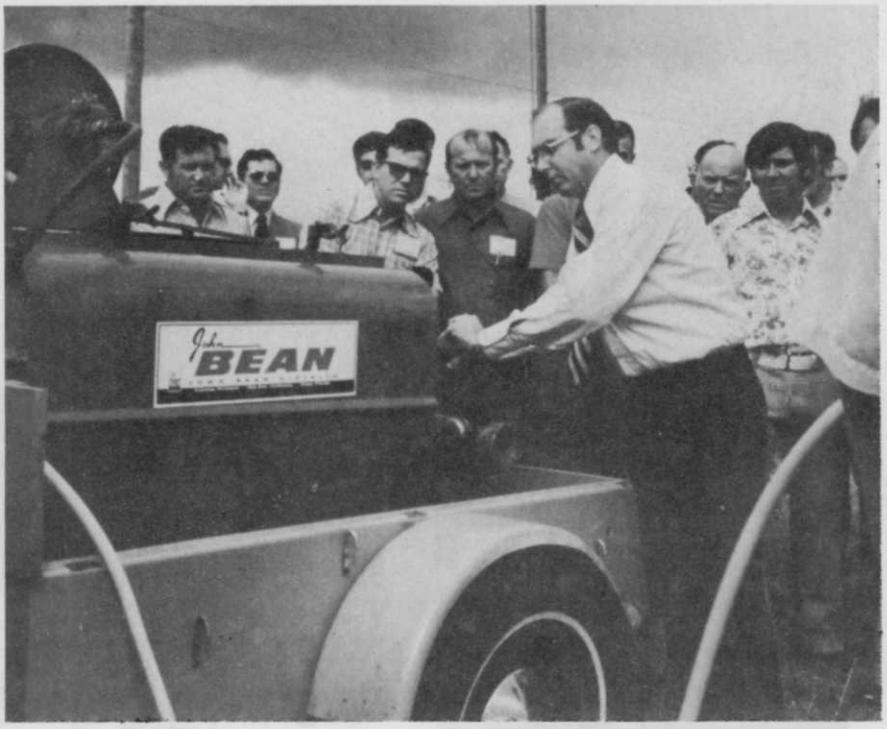


Field demonstrations of sprayers such as this John Bean unit caught the eye of delegates. New equipment is an essential part of any training program. Applicators respond positively to even slight equipment modifications.

During the split session portion of the program, three speakers discussed total vegetation control. Bevan Cates, Van-Waters and Rogers, Dallas, Tex. reported on abatement control, Dr. Allen F. Wiese discussed sterilization, and Robert P. Carter, dept. of soil and crop sciences, Texas A&M spoke on growth regulators.

Lo Drift, a spray additive used to reduce drift potential was demonstrated here. Amchem's ack Thompson showed applicators how to mix and use the material.

About 65 miles of trenching were accomplished. The Dallas/Fort Worth Airport lays claim to the world's largest non-ag irrigation system.

Irrigation Trenching Texas Style

TEXANS, everyone knows, like to do things big!

So it really wasn't much of a surprise when Dallas and Fort Worth announced plans to construct the world's biggest airport.

Located between the two cities, the Dallas/Fort Worth Airport opened in the fall. Covering 17,500 acres, it is larger than New York's Manhatten Island. In 1975, there should be 8 million enplanements. The figure will rise to 24 million by 1985. Including about 18,500 employees, along with passengers, service personnel and visitors, the airport will have a daily population of 100,000 by 1975.

Dallas/Fort Worth Airport is hailed as the best-planned airport facility ever built. And the planning did not neglect beauty. The world's largest airport will have the world's largest non-agricultural irrigation system.

More than $2 million is being spent on the system. Eagle-Formost of Fort Worth is one of the two contractors doing the irrigation job. Eagle-Formost is doing the irrigation work for the airport's spine road system.

Project Manager Dale Ousley says his company's contract comprises half of the total irrigation network. It includes about 65 miles of PVC pipe, ranging from ½- to 4-inches, and 6 million feet of control wire. The pipe is buried from 12 to 18 inches beneath the ground.

All of the work is being trenched, Ousley says.

"We are not doing any vibratory plowing because of the topography. There are no extremely long runs and we need to have the pipe and control wiring in an open trench for inspection purposes."

Ousley's crews are using four different size trenchers, all made by Ditch Witch.

"We have two Ditch Witch C-Model trenchers. They are compact, handlebar units and we use them mostly on traffic islands and other tight areas.

"For the other trenching we are using an 18-horsepower J20, two 30-horsepower V30 and a 65-horsepower R65.

"When we purchased our trenchers, we based our decision on speed, durability, dealer service and potential resale value."

Ousley said another important factor in his selection of equipment was the capability of working on slopes. Ditch Witch, built on a rigid frame, was able to work on extremely steep slopes around the many interchanges. The R65 worked on 3 to 1 slopes.

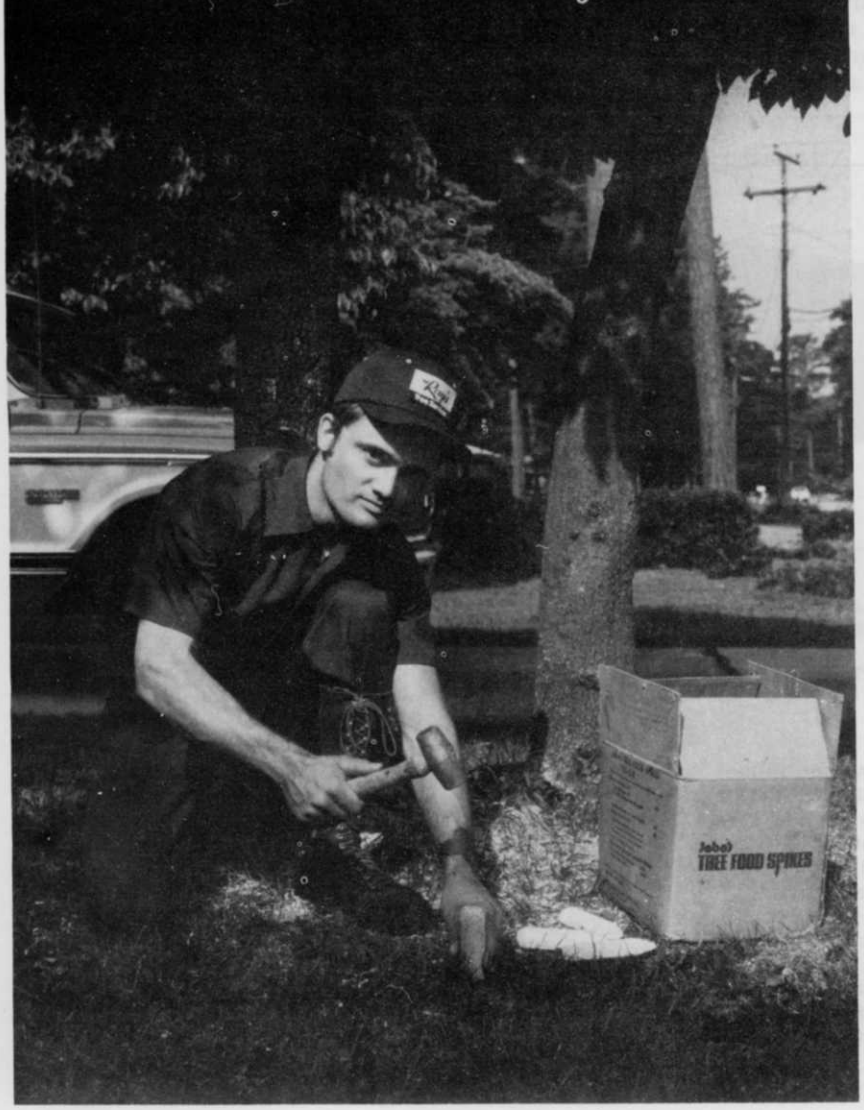
Ousley says the irrigation system is the most sophisticated, workable system in the world. Eventually, its master controllers will be tied in to a computer system.

To whisk people around the sprawling complex, the airport has its own rapid transit system—Airtrans. Electric, 40-passenger rubber-tire cars move through concrete guideways. The average ride to any point is only 8 to 10 minutes.

And as passengers look out of Airtrans, the grass will be a little greener because of a $2 million irrigation system.□

"If you make your living taking care of trees, Jobe's Tree Food Spikes save you time and help your profit."

Ray Kalwara
Ray's Tree Service
Virginia Beach, Va.



"Increment borings have proven to me that you get significant growth with Jobe's Tree Food Spikes. And they're a lot faster than using a drill. My men like them, my customers like them. I like the time they save and the extra money they make for me."
Jobe's® Tree Food Spikes are quicker, easier and more profitable than drilling. Here's proof:

Drilling Method[1]

Bulk 16-8-8 fertilizer—$70/ton *(Example price throughout U.S.)*	
2 lbs./in. of trunk diameter =10 lbs. x 3.5¢/lb.	$ .35
½ hr. labor @ $4/hr.	2.00
Labor and materials	$2.35

$2.35 ÷ 5" tree = 47¢/in. of diameter

No allowance made for depreciation, amortization, breakage of auger, mistakes, etc.

[1] *Using electric auger*

Jobe's Tree Food Spikes Method[2]

5 spikes 16-8-8 fertilizer—22¢/spike	
1 spike/in. of trunk diameter	$1.10
5 min. labor @ $4/hr.	.33
Labor and materials	$1.43

$1.43 ÷ 5" tree = 29¢/in. of diameter, based on 20 case order.

[2] *Based on results of university field tests and recommendations.*

Give Jobe's Tree Food Spikes a try. Contact your local supplier or write direct.

Jobe's®
TREE FOOD SPIKES
462 East High St.
Lexington, Ky. 40508

PIT STOP *(from page 17)*

on target.

Other displays from manufacturers include sprayers from John Bean and Red Ewald. Chemical suppliers represented were Du Pont, the Agricultural Chemical Division of FMC Corporation and Amchem Products, Inc.

The second day of the conference was designed as a workshop for delegates. Keynote speaker for the session was Turney Hernandez, industrial herbicides product manager, E. I. Du Pont de Nemours & Co., Inc.

Hernandez spoke on "Vegetation Problem Analysis." "As custom applicators you need to decide what your customers needs are," he said. "Does he need bareground, short term control (abatement), selective weeding, chemical trimming, or brush control? Perhaps it is a combination of these types of vegetation control."

He pointed out that there are many different types of herbicides and each is designed to give a different response. The key is to know how each product performs so that selection will give the desired results, Hernandez said.

Hernandez then pointed out the needs of various markets. "For railroads, there's a need to control vegetation in yards, around tressels, in between tracks, and along rights-of-ways," he said. "It has been determined that the efficiency in making track inspections has been increased between 50 and 75 percent when tracks are clear of vegetation." In the case of track components, poor weed control contributes to a general downgrading of the railroad in short order.

The product manager said that plant sites of utilities and rights-of-ways were excellent markets for herbicide usage. Other markets include highways, drainage and irrigation ditches, aquatic weeds, chemical trimming around valuable plantings and ranges.

Using slides to illustrate his points, Hernandez also touched on spray volumes, timing of application and equipment needed in getting the job done. "Keeping the material on the target is an absolute necessity," he said.

He listed these factors as those which affect performance of a herbicide: 1. types of plants; 2. soil type; 3. rainfall; 4. the applicator; 5. temperature; and 6. surfactant. He said that some of the reasons for poor control of weeds are rates being too low, poor agitation, poor selection of nozzles, degraded atmospheric conditions, too little or too much rain, and improper calibration of equipment.

How big is the custom application market? Hernandez said that 80 percent of the non crop weed control chemicals are applied by custom applicators. He concluded by saying that the four principles to successful custom weed control are: 1. measure right; 2. price right; 3. apply right; and 4. follow up right.

Delegates then formed three groups to hear panels discuss selective vegetation control, aquatic control and total vegetation control.

Aquatic Vegetation Control: This panel, chaired by John Gallagher, Amchem Products, Inc., reviewed worked being accomplished in Florida and Texas in the control of aquatic weeds. L. V. Guerra, Texas Parks & Wildlife Department, discussed the control of weeds at Cato Lake. Bill Hogan, Ortho-Chevron Chemical Co., said that there are four approaches to weed control in flowing water. They are: mechanical, biological, chemical and natural. He

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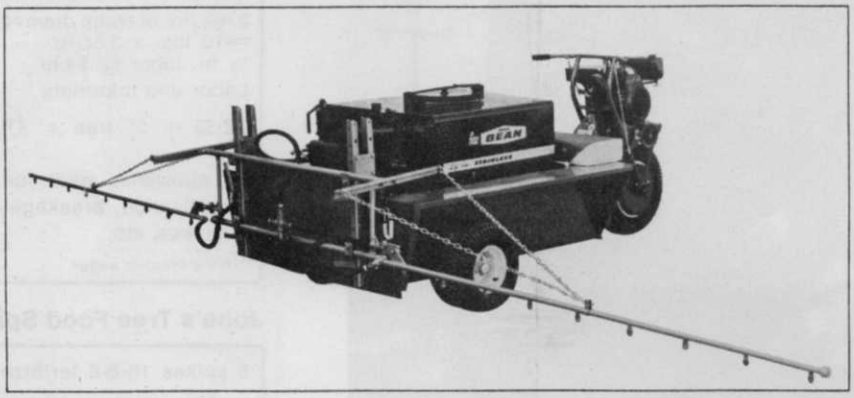

Turfkeeper handles your spraying program without breaking your budget.

With its 100-gallon stainless steel tank, lightweight 15-foot boom (with 5-foot foldaway wings) and 10-gallon a minute spray rate, BEAN'S new Turfkeeper 1010GE is the low-cost answer to golf course spraying. Easy to mount and remove from utility vehicles, Turfkeeper is self-contained with gasoline engine drive, mechanical agitation and Royalette pump. ☐ Using a PTO vehicle? Turfkeeper MF-100-G is for you. Specially designed to maintain desired application rate despite changing PTO RPM'S, this model is extremely lightweight for maximum capacity for any ground condition. ☐ Also available is engine drive Model MF-100-GE for utility vehicles not having PTO drives. Both models have BEAN BONDED tanks with fibreglass centrifugal pumps for pressures up to 60 psi. All Turfkeeper models have outlets for optional hose and gun spraying chores on greens, and shrubs. Turfkeepers keep your costs down, your spray program tops. ☐ Get the full story on all the BEAN spray equipment for golf course use.

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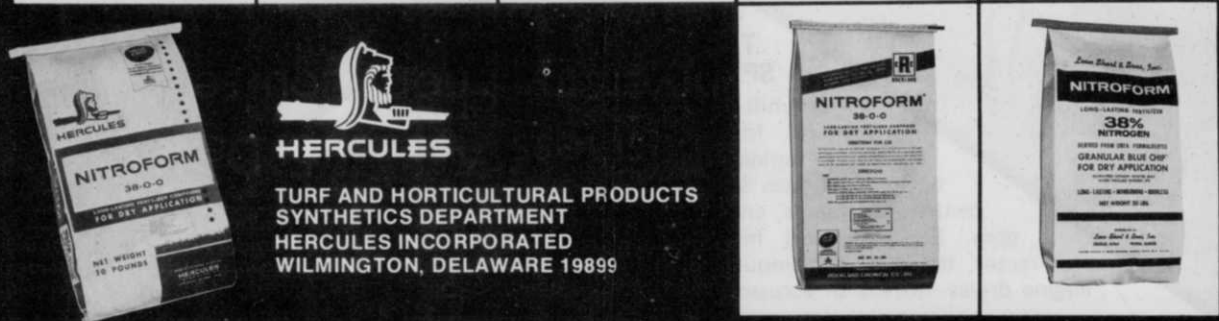

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PIT STOP *(from page 20)*

said that chemical control is the main line of defense today.

Hogan said that where water hyacinths are present, applicators usually use 2, 4-D. "But you can use Diquat around areas of valuable plantings," he said. "Diquat plus copper complex or ion at the rate of two gallons per surface acre (placed in the pater) will also control hydrilla."

Andy Price, Asgrow, Plant City, Fla. said that stream banks can be kept free of weeds by 1. determining the area to be treated, identifying the weed species and solving the problem with the available equipment and chemicals. He pointed out that one reason for the problem in the beginning is a lack of care.

Selective Vegetation Control: Rights-of-ways, parks and lawns, and brush trees and vines were topics discussed in this panel. O. M. Pourciau, Louisiana Department of Highways, outlined where weed control is needed and how to achieve results on rights-of-ways. Dean Bottlinger, Chemical and Turf Specialties, Inc., Dallas, reported on his work in controlling vegetation in parks and lawns. Michael W. King, Louisiana Power & Light discussed vegetation control of brush and trees.

Total Vegetation Control: Dr. Allen F. Wiese, Bushland, Texas presided over this panel and also spoke on bareground weed control. He said that there are two types of soil sterilants, the fumigants with no soil residual and the soil active herbicides which provide long soil residual. The latter group generally upset the metabolism of the plant, leach to about six feet, and are mostly absorbed by roots. Wiese pointed out that one of the problems associated with soil active herbicides is the control of desirable vegetation and herbicide "shift."

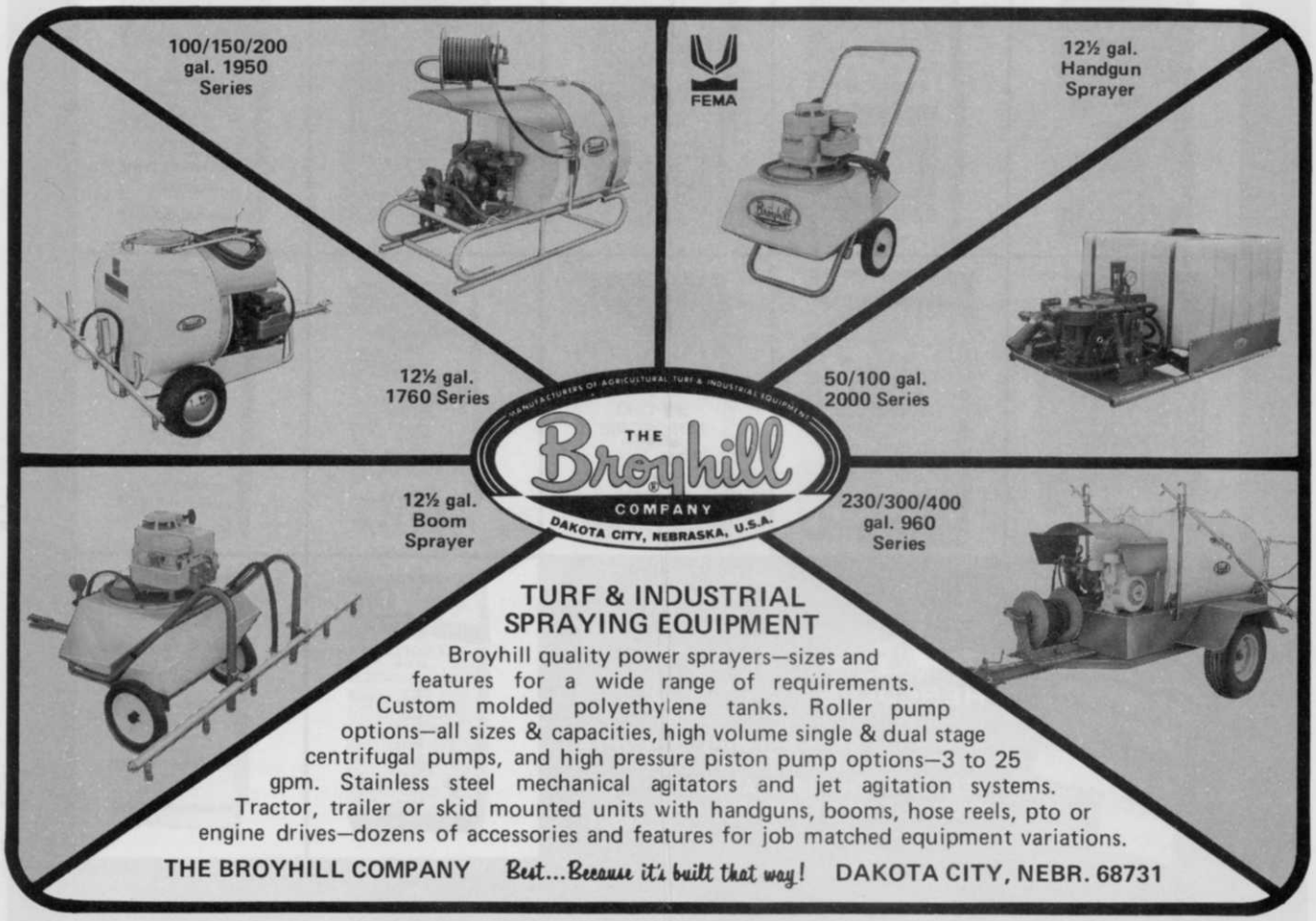
Robert P. Carter, department of soil and crop sciences, Texas A&M showed delegates how growth regulators can be used. He discussed how to use Maintain CF 125 a product of U. S. Borax and Sustar, a new experimental growth regulator. For regulation of growth of turfgrass on lawns, he said it was important to get uniform coverage. He suggested that the applicator double the amount of water needed and cross spray (two directions) to achieve maximum coverage.

Delegates to this year's meeting were asked to state their desires as to meeting location, program and the possibility of establishing an Industrial Vegetation Management Association. It was decided that next year's meeting will again be held on the Texas A&M campus. Delegates felt that the program format should include additional training, Federal and state laws, roadside maintenance, and a greater amount of demonstrations of equipment and chemicals. There was keen interest in starting an association which would focus on the needs of industrial weed control applicators in Texas.□

Training Schools For Mauget Products Announced

About 20 meetings to teach arborists, golf and park superintendents, and others the uses and techniques of Mauget Tree Injection products will be held in 1974, according to an announcement by Del Kennedy, vice president, J. J. Mauget Co., Burbank, Calif.

The meetings will be scheduled in metropolitan centers with easy access to airports and interstate highways. Last year about 2000 people attended the Mauget schools, representing every state.



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Built to make it farther. Faster. Up 40° slopes. Around towers in a 12-foot circle.

Diesel powered. With rubber-belted tracks reinforced by steel cables for strength. And a toboggan-type watertight chassis.

Up front, two rugged rotary mowers clear an 8-foot swath through the underbrush. All clearly visible from the centre-mounted cab.

Before your next job gets bogged down, give Brush Cutter the business. Contact your local Bombardier distributor.

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Green Industry Council Forms In Cleveland

Fourteen men, all spokesmen for various organizations within the Green Industry, met in Cleveland, Ohio in mid-November to form the nucleus of a newly organized Green Industry Council.

Purpose of the meeting was to discuss ways for better coordination of and communication between all Green Industry organizations in dealing with aspects of the current environmental situation. Particularly important to the discussion was use of environmental protection chemicals by commercial applicators as it relates to the Federal Environmental Pesticide Control Act (FEPCA).

Those attending included: John J. Spodnik, Golf Course Superintendents Association of America; F. Farrell Higbee, National Agricultural Aviation Association; Philip J. Spear, National Pest Control Association; Hyland R. Johns, International Shade Tree Conference; Leo D. Creed, Public Utility Arborists Association; F. Raymond Brush, American Association of Nurserymen; William P. Lanphear, National Arborist Association; Edwin E. Irish, National Arborist Association; Albert W. Ray, Michigan Pesticide Applicators Association, Lewis F. Sefton, International Pesticide Applicators Association; Charles Beckwith, Ag. Organic Sales; James A. Sample, WEEDS TREES AND TURF; Arthur V. Edwards, WEEDS TREES AND TURF. Moderator for the meeting was William L. Owen, International Pesticide Applicators Association.

Each man reviewed for the group the activities in which his organization is engaged. In addition, Hyland Johns, who has been active in compiling and assembling information about FEPCA, reported on the current statis of pending legislation.

The group summarily agreed that there is a need for more effective lobbying at state and Federal levels. The voice of the Green Industry is generally not being taken into account in matters concerning pesticide use, noise control, air and water programs and other environmental concerns. Also mentioned was the Occupational Safety and Health Act (OSHA).

Additionally, it was brought out that communications between members needs to be improved within organizations as well as externally. Members of some organizations have had few educational sessions of Federal laws and little or no knowledge of state laws and their impact on the member. Federal legislation adopted and enforced by states could have far-reaching effects on members and their businesses.

Another fact presented was that no one organization was large enough to act as spokesman for the entire Green Industry at this time. Yet, it was pointed out that the tie that binds all organizations together is that nearly everyone uses environmental protection chemicals to one degree or another in his business. The concern about environmental legislation, and specifically pesticides, touches everyone who owns a sprayer.

Thus, the consensus was to form a Green Industry Council which would act as the umbrella organization for all Green Industry associations and organizations. Its function would be advisory, both to the organizations represented — and thus the members—and to those needs affected by current and proposed state and Federal legislation.

The pilot group of 14 proposed a number of ideas to meet the objective of a united Green Industry voice. Better alignment of committee duties within member organizations, contact persons who actively work with state legislative groups, pesticide user conferences at the state level, a formal lobbying organization in Washington D. C. which represents the Green Industry, a challenging public relations program aimed at the consumer, more direct lobbying by Green Industry organizations at the state level, and others were suggestions to accomplish the objective.

Of particular note was a discussion of the Pesticide User Conference (PUC) by F. Farrell Higbee. He said that this informal gathering came about to increase the understanding of pesticide legislation among concerned manufacturers of environmental protection chemicals and member organizations.

It was decided that the Green Industry Council attend a working meeting of the PUC, if possible, to gain a better appreciation of this group. The Council would then meet separately and elect permanent officers and appoint committees.

Temporary chairman of the Green Industry Council is Bill Owen, General Spray Service, Clackamas, Ore.

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Space at clinics previously announced for Chicago, Columbus, Washington, Atlanta, Denver and Portland during January through April 1974 has been entirely booked. Reservations are now being accepted for following clinics:

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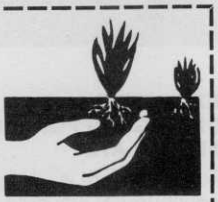

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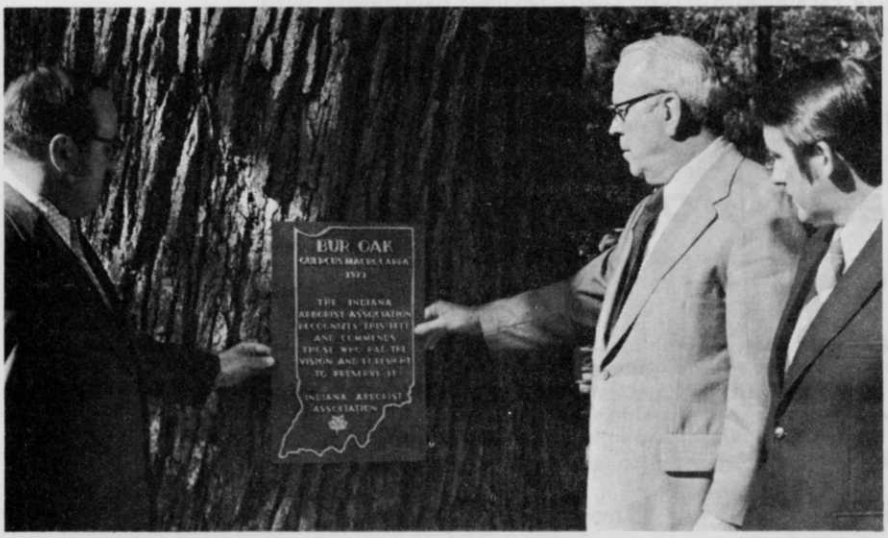

A permanent plaque has been placed on this specimum bur oak. Present are: (l-r) Ralph Mudrack, city arborist, Ft. Wayne; Ralph Husten, VP of Indianapolis Power & Light Co.; and Carl N. Pryor, Indianapolis Power & Light Co. and chairman of Ind. Arborist Assoc.

A plaque presentation ceremony took place under the giant tree. It attracted many neighbors and members of the Indiana Arborist Association.

Indianapolis Bur Oak Saved From Destruction

Indiana Arborist Association members paid tribute to a specimen Bur Oak tree in October with a ceremony and plaque presentation.

The oak was on the property owned by the Kyles and was scheduled for destruction. Through the efforts of the Indiana Arborist Association and the auspicies of the Lilly Foundation, who donated money to purchase the oak and the property, the tree will be saved.

Today the oak is one of the historical landmarks.

Present for the ceremony was Ralph Mudrack, city arborist, Ft. Wayne; Ralph Husted, executive vice president of Indianapolis Power and Light Co. and former pres. of the Irvington Historical Landmarks Foundation; Carl N. Pryor, Indianapolis Power and Light Co. and pres. of the Indiana Arborist Assoc.; John Duling, president-elect, International Shade Tree Conference; and other members of the Indiana Arborist Assn.□

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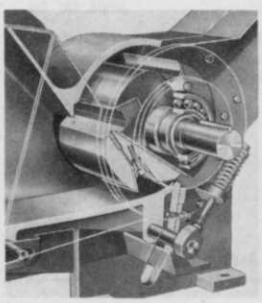

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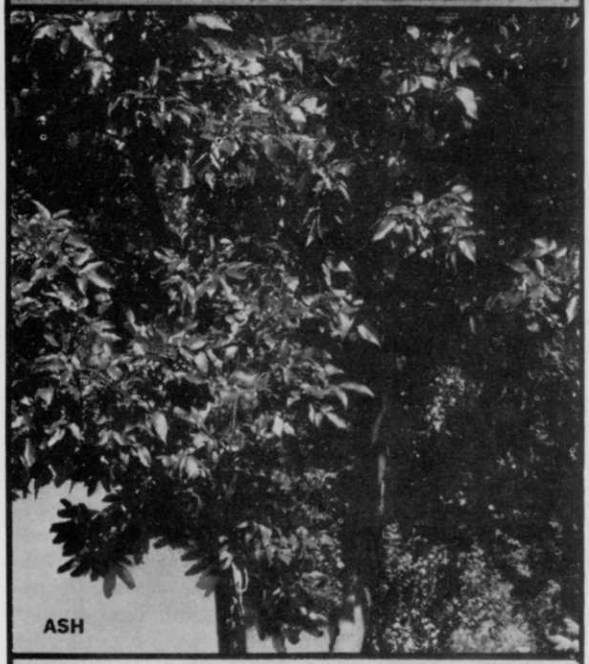

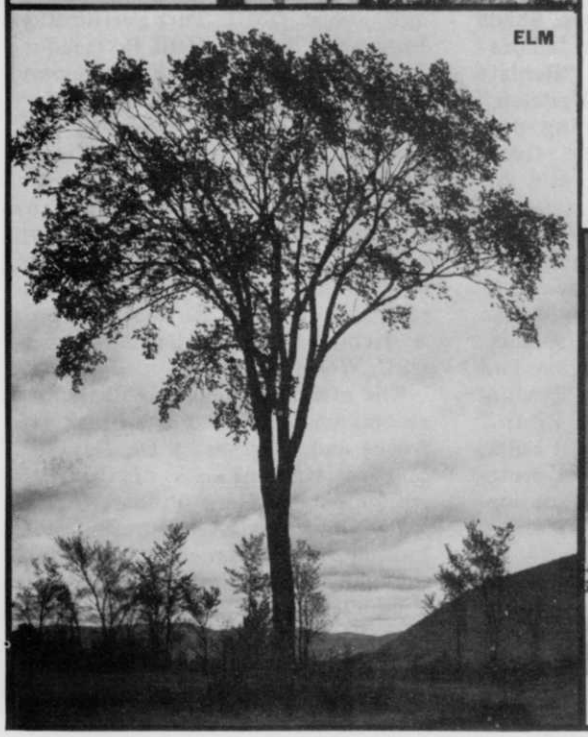

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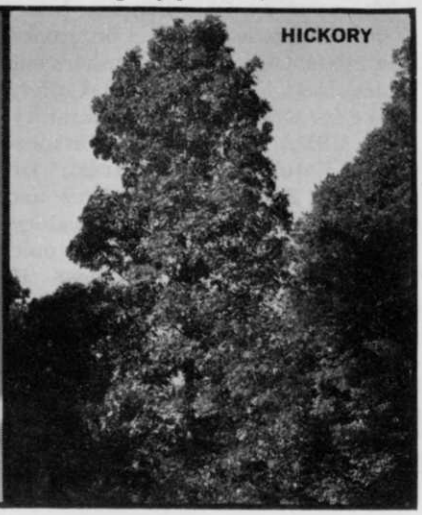
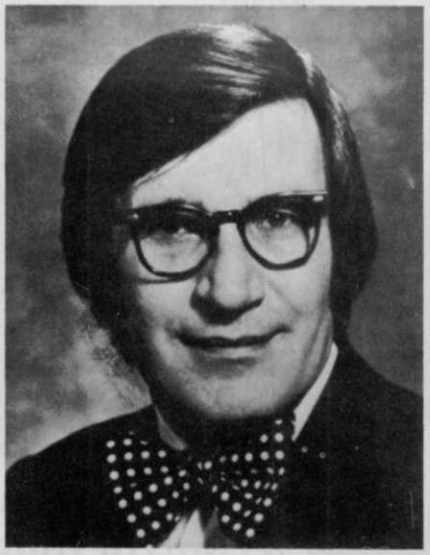


For More Details Circle (143) on Reply Card

William N. (Bill) Ossian, Shenandoah, Ia. will speak Jan. 29 on Shipping Nursery Stock.



Joseph Hudak, vice president of Olmsted Associates, Inc., Brookline, Mass., is a landscape architect. He will speak on Jan. 31 on Approaches To Home Landscaping.

Ira Hayes, asst. vice president, National Cash Register Co., Dayton, Ohio, will speak Jan. 30 on Keeping Pace With Tomorrow.

65 Speakers, 5 Business Areas, 5 Days Ohio State University Short Course

A short course for arborists, turf management specialists, landscape contractors, garden center operators and nurserymen has been scheduled by Ohio State University for Jan. 27-31.

Site for the course is the Sheraton-Columbus Hotel, Columbus, Ohio. Each day's speakers will center their discussions around the overall topic of the day. Thus, individuals wanting to attend only that portion of the meeting pertaining to their particular business may come on a specific day.

The program dealing with commercial arboriculture encompasses two days. Following registration on Sunday, Jan. 27, delegates will hear a panel discussion on "Trees Under Stress" chaired by Dr. L. C. Chadwick, secretary, Ohio Chapter, International Shade Tree Conference, Columbus, Ohio. Panel members and topics include: Dr. Henry Cathey, Chief, Ornamentals Laboratory, ARS, USDA speaking on "Perspective — Nature of Urban Stress;" Dr. Bruce R. Roberts, Shade Tree and Ornamental Plants Laboratory, USDA, Delaware, Ohio and his topic, "Water Stress;" Dr. Spencer H. Davis, Jr., department of plant pathology, Rutgers, "Air Pollutants And Gas Injury;" Dr. Elton M. Smith, landscape horticulture extension specialist, Ohio State University, "Salts and Herbicides;" Dr. Henry M. Cathey, "Stress from Mercury Vapor Lamps;" and H. M. Van Wormer, Van Wormer Tree Service, Inc., Richmond, Va., "Alleviating Stress Below Ground."

Speakers for the next day's session are: Dr. Philip C. Kozel and Raymond R. Chapin, department of horticulture, Ohio State University who will review "Shade Tree Evaluation Studies — OARDC;" and Prof. Clarence E. Lewis, professor emeritus, Michigan State University, whose topic will be "Trees, Shrubs and Evergreens Tolerant to Urban Stress." Dr. Charles L. Wilson, Shade Tree and Ornamental Plants Laboratory, USDA, will discuss "Benlate and Injection Systems — Updated." Last speaker on the morning program is John Mixon, forester, Georgia Forestry Commission, and his topic "Urban and City Street Tree Programs and Problems."

Arborists and others attending the afternoon session will hear two well-known speakers and then split into workshop sessions. F. Lewis Dinsmore, Dinsmore Tree Service and ISTC president will discuss "Bidding and Pricing Tree Work for Profit." He will be followed by Robert Felix, Harder Services, Inc. and past president National Arborist Association. Felix will speak on "How to Manage an Arborists Business."

The split sessions will concern commercial arboriculture, utility arboriculture and Municipal arboriculture and park management. The sessions will permit time for speakers and questions and answers.

Evening speaker is Prof. Ron Taven, University of Missouri. His topic is "Can't See The Trees For The Forest."

Concurrent with the second day of the arborist program will be a day devoted to turf management specialists. Moderator for the morning session is Dr. David P. Martin, extension agronomist, Ohio State University. Topic to be discussed include. "Soil Testing for Turf Areas" by Dr. John F. Trierweiler, extension agronomist, OSU; "Turf Fertilization Programs" by Dr. Paul R. Henderlong, department of agronomy, OARDC, Columbus, Ohio; "Turf Renovation and Overseeding" by Ned Brinkman, sales engineer, Jacobsen Manufacturing, Racine, Wisc.; "Turfgrass Shade Culture" by Dr. James F. Wilkinson, department of Agronomy, OARDC, Columbus, Ohio; and "Planning For Turf Maintenance" by Fred K. Buscher, area horticulture agent, extension service, OSU, Wooster, Ohio.

The afternoon session will include recommendations for bluegrass, fescue and ryegrass by Dr. David P. Martin; efficient use of turfgrass equipment by Gene Probasco, Central Ohio Sales Representative, Lakeshore Equipment & Supply Company, Cleveland; "Selling Turf Products" by William Weagly, manager, Scotts Training Institute, O. M. Scott & Sons, Marysville, Ohio; and "What's Bugging You?" by Dr. Richard Miller, extension entomologist,

OSU and Dr. Robert Partyka, extension pathologist, OSU.

Nursery day is planned for January 29. Moderator for the morning session will be Dr. Ken Reisch, associate dean, college of agriculture, Ohio State University. Speakers are: Prof. Ron Taven who will discuss "Techniques of Using the Camera Effectively;" William Ossian, Shenandoah, Ia. whose topic is "Shipping Nursery Stock;" Dr. Jack Gartner, horticulture department, University of Illinois, "Hardwood Bark As A Growing Medium;" and Al Fordham, Arnold Arboretum, Cambridge, Mass. who wil speak on "Dwarf And Abnormal Conifers And How They Originate."

Following a discussion on new plants by Prof. Clancey Lewis, Michigan State University, delegates will adjourn to split sessions. Topics this year are: Propogating Softwood Cuttings; Medias For Container Nursery Stock; Pest Control — Wildlife, Diseases, and Insects; and Weed Control — Keys To Success.

Of interest to many will be a day devoted to garden centers. Prof. Ransom Blakely, horticulture department, Purdue University will discuss a case study of how advertising helps the garden center business. Loren Bloom, Franks Nursery Sales Inc., Detroit, Mich. will present a discussion on "Trends In Consumer Demands For Plants." "Merchandising Bedding Plants" is the topic of Dr. Will Carlson, horticulture department, Michigan State University.

Again, split sessions will highlight the afternoon. Three workshops have been announced: Foliage plants For Garden Centers; New Ideas For Sales; and Garden Center Layout And Display.

In addition, Robert Tuinstra, Fruit Basket Gardens Inc., Comstock Park, Mich. will discuss "Coordinating The Advertising Program" when the delegates reconvene. He will be joined by Ira Hayes, assistant vice president, National Cash Register Co., Dayton, Ohio, who will discuss "Keeping Pace With Tomorrow."

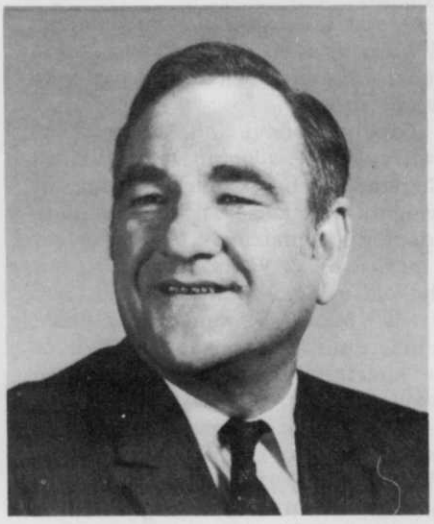
The last day of the short course will concern landscape contractors. Dr. Davis Sydnor, assistant professor, horticulture, Ohio State University will be moderator in the morning; Dr. James Aylsworth, extension horticulture agent, Ohio State University will be moderator in the afternoon.

Joe Hudak, Olmsted Associates, Inc., Brookline, Mass. will discuss "Approaches To Home Landscaping." He will be followed by a speech "Combining Plant Materials And Design In The Residential Landscape" by William Heard, Heard Gardens, Des Moines, Ia. Last speaker in the morning will be Dr. Roy Mecklenburg, horticulture department, Michigan State University. His topic is "An Analysis of Landscape Bidding Practices."

Of particular note this year will be a speech by Dr. Jot Carpenter, chairman, landscape architecture, Ohio State University. His speech title is "Landscape Design Critique."

In the split sessions that follow, delegates will be able to choose between three topics to further their knowledge in landscaping: Practical Bidding Systems; New and Improved Plant Materials; and Landscaping For Simplified Maintenance. A panel of four landscape professionals will head the first session. Topics covered in the plant materials sessions include ground covers, perennials and trees and shrubs. The last session will deal with making maintenance simpler in commercial and residential landscaping. Products to accomplish this job will be discussed.

F. Lewis Dinsmore is president, Dinsmore Tree Service, Inc., St. Louis, Mo. and president, International Shade Tree Conference. He will speak Jan. 28 on Bidding And Pricing Tree Work For Profit.



Dr. Jack Gartner is head of the division of ornamental horticulture, University of Illinois. He will discuss Hardwood Bark As A Growing Medium on Jan. 29.

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THE METRIC SYSTEM

(from page 14)

days. This is now known as the Celsius scale. It is identical to the old Centigrade scale; it has simply been renamed to honor the scientist who originated the idea. Zero on the Celsius scale is the freezing point. 100 degrees Celsius is the boiling point of water.

After you have checked the temperature on this morning 20 years from now, you shower and shave and sit down to breakfast. Instead of taking a quart of milk from the refrigerator, you take a liter of milk — just a fraction more than a quart. If you have a bowl of cereal, the box gives the net weight in grams, not in ounces.

After you finish breakfast, you kiss your "perfect 91" good-by and hop into the car for the drive to your office. The office is no longer 10 miles away but, instead, 16 kilometers away. And you don't drive 60 miles an hour. You drive 96 kilometers an hour.

On the way you stop for gas and tell the attendant to "fill it up." He puts in 60 liters — about 16 gallons. At today's gasoline prices, the attendant would charge you between 10 and 12 cents a liter. I have a suspicion the price may be higher by that time!

So far, except for the Celsius temperature scale, the metric terms we have used are familiar — liter, gram, kilometer. But if you ask the gas station attendant to check your tires, he won't inflate them to 30 pounds per square inch but, rather, to 200 kilopascals. The "Pascal" is a unit of pressure, and to most of us it is a new term that we will learn to use when we convert to the metric system.

In our daily life, we will use the metric system in many other ways. When we mow our lawns, we will set the mower for 5 centimeters, not 2 inches. When we buy a belt, it will be so many centimeters long. When we order lumber, we won't order 2 by 4's. And when we step on the bathroom scale, it won't read 200 pounds. It will read 91 kilograms.

We and our parents and grandparents have been happy with our Fahrenheit thermometers, our 12-inch rulers, and our quarts of milk. Why should we change to the metric system?

One, it is a better system than our English system. It is simpler, more coherent, more logical, and easier to work with.

Two, we have no choice. *The entire world is going metric.* Even England, where our system of weights and measures originated, has adopted the metric system and, over a period of 12 years, is phasing out the old system of inches, feet, and yards; ounces, pounds, and tons; pints, quarts, and gallons. Mexico is metric. Canada has committed itself to going metric.

We are almost alone in the world in sticking to the English system. There are only 11 other countries that haven't taken steps to go metric, Trinidad, Barbados, Jamaica, Guyana, Gambia, Sierra Leone, Southern Yemen, Muscat, and Oman and Burma. In addition to these, there are two small island countries in the Pacific, Tonga and Nauru, which have still not committed themselves to the metric system.

This is a ridiculous situation for the United States. We are in step with 11 countries which have a combined population less than the state of Texas and a combined area just slightly larger than the state of Texas. We are out of step with the rest of the world.

Obviously, the United States has to go metric. Is it a big step? Of course it is. But it isn't as big as we might think.

There will be a period of transition. You and I have a period of years in which to learn to use the metric system.

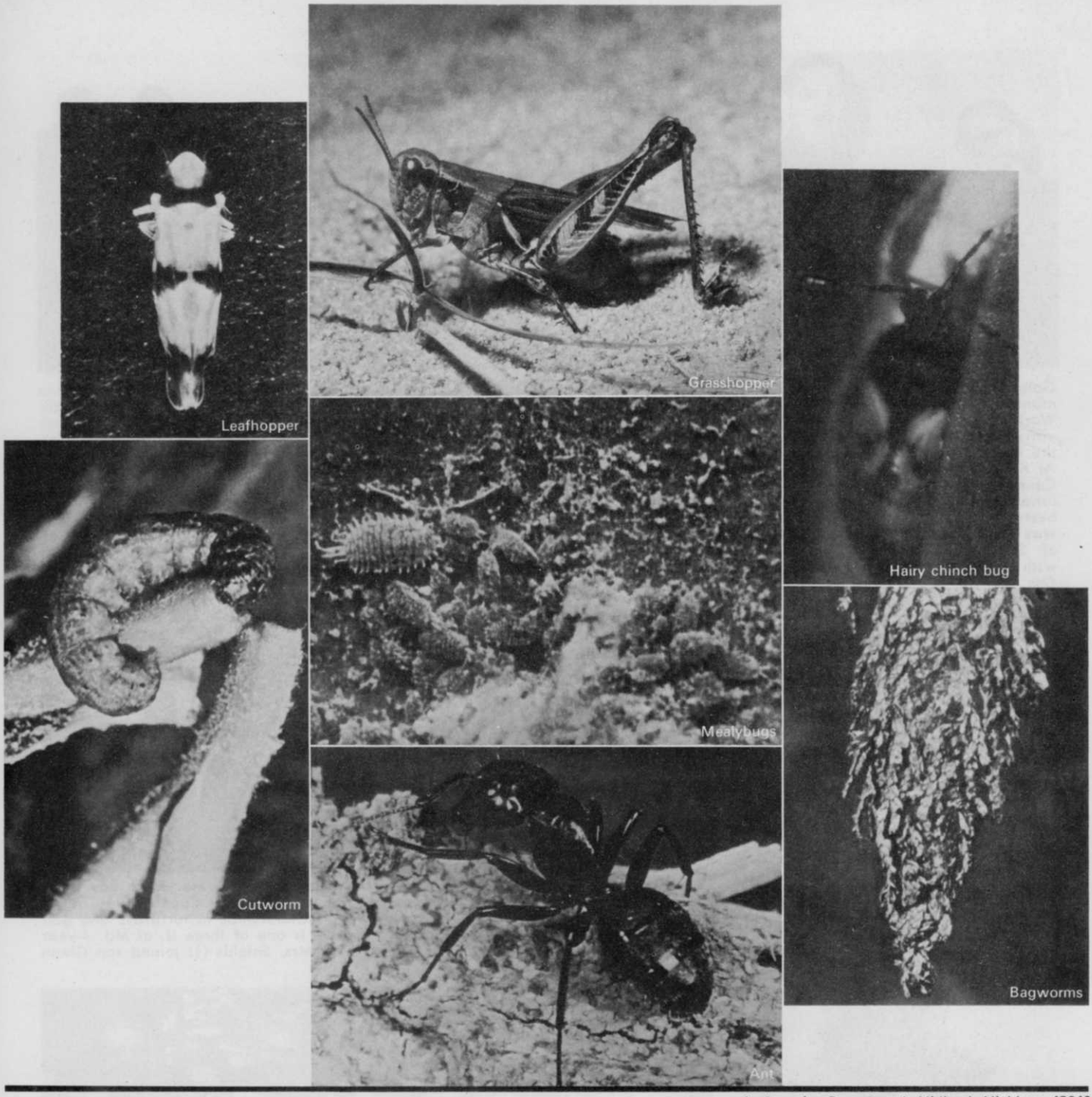
Secondly, that transition period has already begun.

In our daily life, we are accustomed to buying 8 mm, 16 mm, and 35 mm film for our cameras. Your druggist measures your prescription in grams and milligrams. Many of our packages today are expressed in weight by both ounces and grams.

Some of us may be counting calories. Others perhaps should be. A calorie is the amount of heat required to increase the temperature of one gram of water one degree Celsius, and is therefore a metric unit. So keep on counting calories. They won't change.

In our business life, that transition period has begun also. The real effort and the actual dollar costs of converting to the metric system fall most heavily on business and in-

(continued on page 86)



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Gabe Eros (1) president and general manager of Oseco Ltd. receives the World Championship award for the variety Highlight Chewings Fescue at the Royal Winter Fair in Toronto, Can. At right is Paul King, chairman of the Canadian Seed Trade Assn. public relations committee. The seed, judged best in the pedigree forage seed class, was grown for Oseco by Walter Hafner of Sublimity, Ore., by arrangement with International Seeds of Halsey, Ore.

New to New England is a growing sod industry. It has grown from a few dozen acres in 1963 to several thousand in 1973. These are sod producers who are members of the New England Sod Producers Assoc. They toured turfgrass research plots at the U of R. I. in September. Professor Dick Skogley has been working closely with this group.

Green Industry Newsmakers

PEOPLE PLACES EVENTS

An Honorary Certificate of Merit from the University of Maryland has been awarded to L Robert Shields, golf superintendent, Woodmont Country Club, Rockville, Md. He has helped establish college-level scholarships in turfgrass and golf course management. In fact, Glenn S. Shields (r) is one of three U. of Md. 4-year students to receive the scholarship for 1973-74. Mrs. Shields (1) joined son Glenn and Bob for the presentation.

This is Midwest, a new variety of crabapple just released by the USDA Soil Conservation Service Plant Materials Center, Mismarck, N. D. It is disease resistant, winter hardy — even in Nodak country — propagates well from seed, grows fairly rapidly and makes good growth shape. It bears small apples, about ¼ inch in diameter. The fruit remains on the tree and forms "raisins" that stay on until spring or until harvested by wildlife.

The executive committee of the Horticultural Research Institute has recommended that HRI serve as a pipeline of information from all segments doing research related to the industry. Committee members shown here are: (1-4) Donald Murray, Stoffel Seals Corp., N. Y.; R. E. "Ed" Brown, Goochland Nurseries, Inc., Fla.; Don McConnell, McConnell Nursery Co., Ltd., Canada; Robert Siebenthaler, The Siebenthaler Co., Ohio; Evert Asjes, III, Rosehill Gardens, Inc., Mo., HRI pres.; Patrick, HRI administrator; Albert "Bud" Cartwright, Jr., Cartwright Nursery Co., Tenn.

WEEDS TREES and TURF

PULL OUT SECTION

1974 MANAGERS GUIDE TO EQUIPMENT AND SUPPLIES

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1974 Managers Guide To Equipment And Supplies

Making the right decision in selection of equipment and supplies is one of the most important jobs of a manager in the Green Industry. Besides being an important item on an investment budget, equipment must also be maintained. This calls for wise initial selection, correct accounting procedures for depreciation, effective preventive maintenance and proper major maintenance when needed.

Perhaps the most important step is in selection. It is with this in mind that WEEDS TREES AND TURF presents this 1974 Green Industry Managers Guide To Equipment And Supplies.

The Guide is in two parts. Manufacturers and their equipment and supplies are listed first. **Advertisers are in bold face type.** Product groupings and manufacturers of a particular item are listed second. Because manufacturers add and delete product lines, change names and generally never remain static, omissions of certain manufacturers and/or product lines are unavoidable. Your comments and suggestions are invited to help improve future editions.

A

AMF Western Tool Division, 3811 McDonald Ave., Des Moines, Iowa 50313
Mowers, rotary
Tractors, AMF 1281 and AMF 1293
Riding mowers, rotary

A.O.A. Research & Development, Inc. (P.O. Box 6081C) 608 Virginia Dr., Orlando, Fla. 32803
Underwater weed cutter, manually operated, spring steel, serrated, doubleaction blades cuts weeds with forward and backward stroke

Ace Pump Corp., 1650 Channel Ave., Memphis, Tenn. 38113
Pumps, centrifugal
Pumps, nylon roller
Pumps, diaphragm

Ackley Mfg. Co., 13770 S.E. Ambler, Clackamas, Oreg. 97015
Ackley, pole circle saw, hydraulicly powered; pole chain saw, hydraulic; chain saw, hydraulic; pruners, hydraulic; alternator, hydraulic; sump pump, hydraulic

ADS—Advanced Drainage Systems, 1880 MacKenzie Dr., Columbus, Ohio 43220
Corrugated Plastic Drainage Tubing, sizes of tubing and fittings from 4 inches to 18 inches in diameter

Adventure Line Mfg. Co., 3333 Main St., Parsons, Kansas 67357
Astro Hook, crane/ladder, truck mtd., hydraulic
Highworker, platform lift, truck mtd., hydraulic
Tailgate, 1,000 lb. cap. pickup mtd. tailgate, all of our equipment is designed for use on pickup trucks

Aeroquip Corporation, 300 S. East Ave., Jackson, Michigan 49203
Hose and fittings, hydraulic, fuel, air, oil, water; pressure from low to super high

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AgTronics Mfg. Co., 1560 State St., Barstow, Calif. 92311
Soil moisture meter

Air-Lec Industries, Inc., 3306 Commercial Ave., Madison, Wisconsin 53714
Air-Lec, aquatic weed cutter
Air-Lec, aquatic weed rake

Air Rake Mfg. Corp., 5 Springfield St., Chicopee, Mass. 01013
Blowers, leaf

Alcoa Aluminum Co. of America, Alcoa Building, Pittsburgh, Pa. 15219
Irrigation pipe

Allis-Chalmers, 1205 S. 70 Street, Milwaukee, Wisconsin 53211
Model 620 tractor, 19½ hp with tires rear 34.0"
Model 615 backhoe-loader, Allis-Chalmers 56 hp gasoline engine
Model 816 backhoe-loader, Perkins diesel engine 83 hp
Model 918 backhoe-loader, Allis-Chalmers diesel 84 hp engine
Mower (sickle bar), length 56" tractor (620) mounted
Rear mtd. Roto-Tiller, 48" size for 620 tractor
Rotary mower, 48" swath for 620 tractor

Amchem Products, Inc. Brookside Avenue, Ambler, Pennsylvania 19002
Meter Miser, liquid spreader gives precision application of Weedone liquid herbicide products without the need for calibration
Directa-Spra, sprayer end unit

American Arborist Supplies, Concord Industrial Park, Concordsville, Pa. 19331
Arborist supplies

American Excelsior Corp., 850 Ave. H, East Arlington, Tex. 76010
Erosion Control Products
Soil Retention Products

American Hose & Reel Co., P.O. 639, Marland, Okla. 74644
Thermoplastic spray hose with working pressure of 250, 400 and 800 PSI; ¼, ⅜, ½, ¾-inch sizes
Fertilizer applicator tubing; ¼, ⅜, ½, ¾-inch sizes
Hose reels; small, 300 ft., ½-inch hose, 1000 P.W.P.; large, 300 ft., ¾-inch; adjustable drag

American Lincoln Corp., 518 S. St. Clair, Toledo, Ohio
Welders

American Optical Corp., 14 Mechanic St., Southbridge, Mass.
Respirators, protects against harmful, highly toxic sprays, dusts and vapors in inticides, fertilizers, etc.
Eye protection goggles, protects against impact or dust & chemicals resulting from spraying, dusting, cutting, etc. Available with clear or sunglass lenses, plain or coated for anti-fogging.
Hard caps and hats, head protection against falling limbs or branches — Meets Amer. Nat'l Std. Z89.1-1970
Hearing protectors, protects hearing from damaging or irritating noises of tractors, sprayers, power saws, etc.

Ametek, Plymouth Plastics Division, 502 Indiana Ave., Sheboygan, Wisc. 53801
Superflexon plastic boxes, plastic irrigation valve boxes with turf green covers
Meter pits, plastic

Amoco Chemicals Corp., Industrial Products Div.,1530 Commerce Dr., Stow, Ohio 44224
Polyethylene pipe and fittings for irrigation
PUC pipe and fittings for irrigation
Corrigated plastic drainage tubing

Andrasko Engineering Co., P.O. Box 4633, Santa Barbara, Calif. 93103
The Meter Matic, fertilizer injector for irrigation systems

Aqua-Dial, P.O. Box 1325 Newport Beach, Calif. 92624
Turf irrigation Equipment
Automatic valves, hydraulic and electric, remote control
Automatic controllers
Sprinklers, gear driven, pop up, vandal resistant, lawn and garden

Aquamarine Corp., Box 616, 1116 Adams, Waukesha, Wisc. 53186
The Aqua-Trio, 3-piece aquatic weed harvesting system (harvester, transport and shore conveyor)
The sawfish, an aquatic weed cutter and front end loader (for weed, trash and/or oil spill cleanup on water)

Aqua-Mech Co., 2609 Cedar Springs Rd., Dallas, Tex. 75201
Aqua Mech, conversion kit from manual valve and key to automatic timed heads

Aquanautics, Inc., 1246 Birchwood Dr., Sunnyvale Calif. 94086
Weedrake, underwater air boat

Aquatic Controls Corp., 1203 E. Main Waukesha, Wisc. 53186
Weedrake, underwater

Arctic Mizer Mfrs., Inc., 2116 E. Norse Ave., Cudahy, Wis. 53110
Arctic Mizer, spreader, self-powered; vacuum-thatcher, self-powered

Ariens Company, 655 W. Ryan Street, Brillion, Wis. 54110
Ariens Emperor, riding mower — 30" and 38" rotary; 8 hp
Ariens Fairway, riding mower — 26" rotary; 5 and 7 hp
Ariens S-8 Tractor, lawn tractor — 36" rotary; 8 hp
Ariens Lawn Vac, lawn vacuum
Ariens Trac-Team, 26" rotary mower, lawn vacuum, rotary broom on one 8 hp tractor

Armor Metal Products, P.O. Box 822, Helena, Montana 59601
Anderson Rock Picker, heavy-duty rock removal machine for use in seedbed preparation

Asplundh Chipper Co., Div. Asplundh Tree Expert Co., 50 East Hamilton St., Chalfont, Pa.
Chipper, high speed, tapered blade
Forestry truck, Models L-40, 42, 45, 50; dump body, 12-inch chipper, aerial bucket
Brush hooks

Arps Corp., 1711 Wisconsin Ave., New Holstein, Wis. 53061
Arps 728, backhoe, tractor-mounted
Arps 730, backhoe, tractor-mounted
Arps blades and rakes, landscaping rakes and utility blades
Johnson "Work-Horse", front-end loader, garden tractor-mounted
Johnson "Terra-Comb", combination thatcher and power-rake
Arps mini-blades and rakes, blades and rakes for garden tractors

Aurora Pump Div., N.Y. Air Brake, 800 Airport Rd., Aurora, Ill. 60542
Aurora pumps, irrigation pumps centrifugal and turbine pumps

Auto Hoe, Inc., S. 3rd St. De Pere, Wis. 54115
Auto Hoe, power hoeing machine

Avco New Idea, Farm Equip. Div., 420 S. First St., Coldwater, Ohio 45828
E650, tractor, electric driven,14 hp
E6T-120, tractor, electric driven, 12 hp

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(7) **GREENSWEEP*.** Picks up cores, thatch, debris from greens, turf and pavement.

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*Self-powered and/or propelled.

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E6T-80, tractor, electric driven, 8 hp
35 accessories available to work with all electric tractors

Avco Ezee Flow, Istand Sycamore, Coldwater, Ohio 45828
Spreaders, gravity drop, broadcast, fertilizer
Seeders, broadcast
Mowers, rotary
Applicators, granular, insecticide-herbicide

B

B.A.G. Corporation, 9443 Sherwood Glen, P.O. Box 28403, Dallas, Texas 75228
Taicon Container, plastic, collapsible, reusable shipping container for handling bulk shipments
Super sack container, one-ton disposable container

BMB Company, Inc., North Vermont at 9th, Holton, Kansas 66436
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Special, 6' tractor operated rotary mower
XL and Brute, 5' and 6' tractor operated rotary mower
Fury, 7' tractor operated rotary mower
Twin Brute 120 and 144, 10, and 12, tractor operated rotary mower
Twin Fury 144 and 160, 12 and 13'4" tractor operated rotary mower
Mighty Mower, 15, 18' and 20' flexible tractor operated rotary mower
Suburban 48, 48" trailing rotary mower w/ 8 hp gas engine
BMB Flail Mowers, 72", 90", 144" and 180" tractor operated

Baker Equipment Mfg. Co., 1710 High Point Ave., Richmond, Va. 23230
Aerial towers, mobile equipment
Derricks, mobile equipment

Bartlett Mfg. Co., 3024 East Grand Blvd., Detroit, Mich. 48202
Saws, tree, combination pruner and saw
Saw, pruning, hand
Saw sheaths
Tree bracing materials

Bar-Way Mfg. Co., P.O. Box 640, Stamford, Conn., 06904
Spray guns, long-range, worm-gear control on end of barrel

John Bean Div.,FMC Corp., 1305 S. Cedar St. Lansing, Mich.
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Flamethrowers, (sprayers)

Beatty Trailers, Box 1027, Burlington, N.C., 27215
Beatty Trailers, self-contained, hydraulic dump; capacities 2, 3, 5, 9, 13 yard; transport trailers, 6 to 30,000 lb. capacity; tag-a-long and goose neck

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Sod-O-Matic sod cutter, sod cutter cuts 3 16" strips at one time
Sod-O-Matic sod harvester, Beck's big roll — sod harvesting and laying system

Beeco Products Co., Fort Washington, Pa.
Becco-Mist, spray sleeve, Model 275 spray head

Bell Helicopter Co., P.O. Box 482, Fort Worth, Texas
Helicopters

Bemis Company, Inc., 800 Northstar Center, Box 215, Minneapolis, Minn. 55402
Bags and liners, plastic
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Twine, tying

Wm. Bergman Co.,1335 M-15, Reese, Mich. 48757
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Berkeley Pump Co., 829 Bancroft Way, Berkeley, Calif. 94702
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Bermuda King, Inc., Rte. 1, Okarche, Okla. 73762
Sprig harvesters, 20", 28", 42", 30 to 60 hp, 500 to 1,000 watt an hour rating
Sprig planters, 1, 2, 3 and 4-row, large capacity
Fairway spriggers, 2 to 10' width, large capacity

Bete Fog Nozzle, Inc., Greenfield, Mass.
Stubbies, nozzles, mini-sized, three cone angles, flow rates from 3 to 300 gpm

Big Brute Turf Cut, Div. of Finney Frocks, 18035 Georgia Ave., Olney, Md. 20832
Big Brute turf cutter, sodcutter

Big "J" Products, Route 1, Hanna, Indiana 46340
Sod harvester, dual palleted

Billy Goat, P.O. Box 229, Grandview, Mo. 64030
Billy Goat, suction sweeper
Winro, leaf blowers Shred-N-Bag, shredder
Chippit, chippers, vacuums

Black & Decker 701 E. Joppa Road, Towson, Md. 21204
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Grass shears, battery powered (re-chargeable)
Hedge trimmers, 13" to 22" Black Knight—both electric and battery
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Garden hose connectors, complete line of hose fittings

John Blue Co., P.O. Box 1607, Huntsville, Ala. 35807
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Bombardier limited Valcourt, Quebec, Canada
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Muskeg carrier, tracked vehicle (90 hp) with spraying equipment

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Bridgeport Implement Works, Inc., 60 Rachel Drive, Stratford, Conn. 06497
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Swing-Cut, rotary mower (60" and 72")
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1570	1"	40 GPM	3 GPM
3141	2"	150 GPM	5 GPM
7065	3"	325 GPM	10 GPM
12568	4"	550 GPM	20 GPM
28274	6"	1500 GPM	30 GPM
50240	8"	3000 GPM	40 GPM
113040	12"	9000 GPM	60 GPM

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Sprayers, trailer mounted, mechanical agitation
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Buckner/Johns Manville Irrigation, Greenwood Plaza, Denver, Col. 80217
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Buffalo Turbine Ag. Equipment Co., Industrial Place Gowanda, N.Y. 14070
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Sprayer-duster, mist duster, combination
Duster, dust only
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Bunton Co., 4303 Poplar Level Rd., Louisville, Ky. 40213
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Lawn and turf equipment

C

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Challenger, rotary mower
Manta Ray Interstate, rotary mower, 10 ft.
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Shark-go, flail-type shredder, 90 inches
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CareTree Systems 7030 Huntley Rd., Worthington, Ohio 43085
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Cast Iron Pipe Res. Assoc., 1211 W. 22nd, Oakbrook Exec. Plaza, Suite 23, Oakbrook, Ill. 60521
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Campbell-Hausfeld Co., Sales Ave., Harrison, Ohio 45030
CH "1000", Saw, chain, electric, 12-inch bar, 12 amps
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CH "80", saw, chain, gasoline, 16-inch bar
CH "3001", saw, chain, gasoline, ½ "anti-vibe", 16-inch bar, auto oiler
CH "3002", saw, chain, gasoline, ½"anti-vibe", 20-inch bar, auto oiler
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Blades, tractor mounted, scraper and scarifier
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Trenchers

Century Engineering Corporation, 221—4th Ave. S. E., Cedar Rapids, Iowa 52401
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Certain-teed Pipe & Plastics Group, Valley Forge, Pa. 19481
Certain-teed PVC pipe, irrigation; choice of Fluid-Tite™ double gasket joints or solvent-weld joints
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Champion Brass Mfg., 1460 N. Naud St., Los Angeles, Calif. 90012
Champion 466, 466P, anti syphon valves
Champion 17, 18, 19, lawn sprinklers, flush, popup, shrub
Champion E.A., C.E.A., electric adapters

The Champion Company, 400 Harrison St., Springfield, Ohio 4550
Doo-All Roll-Dump Trailer, 1 and 2 cu. yd. hopper capacities
Doo-All End-Dump Trailer, 3 cu. yd. hopper, hydraulic dump

Charles Machine Works, Inc., P.O. Box 66, Perry, Okla. 73077
Ditch Witch trenchers, 7 hp to 195 hp vibratory plows, backhoes, trencher mounted trailers, horizontal boring units

Clark Equipment Trailer Division, P.O. Box 410, Michigan City, Indiana 46360
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Clinton Engines Corporation, Clark & Maple Streets, Maquoketa, Iowa 52060
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Caroche Utility Truck, four-wheel electric utility truck (2 passenger and 500 lb. load
Caroche Personnel Carrier, Four-wheel electric (4 passengers)
Caroche Islander, combination commuter & golf car

Container Development Corp., 424 Montgomery St., Watertown, Wisconsin 53094
Golf course equipment

Contree Sales, Inc., P.O. Box 129, Columbus, Wis. 53925
Rice Paddy Daddy, sprayer
Boom Dye-Marker, marks areas treated
Wat Sol Oil, lubrication, preservative, storage oil
Auger, Model S.S., 4-inch, 12 volt for materials handling

Conwed Corporation, 2200 Highcrest Road, St. Paul, Minn. 55113
Conwed Hydro T-M Mulch, a wood fiber mulch used in hydro seeding
Conwed Economy Erosion Control Netting, tough plastic net used over loose mulches in high erosion areas

Cooper Mfg. Co., 422 S. First Ave., Mardhaltown, Iowa 50158
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Champion 21, greensmower

Corona Clipper Co., 14200 E. 6th, Corona, Calif. 91720
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Correct Mfg., Hughes Keenan Div., P.O. Box 689, Delaware, Ohio 43015
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Coursigns, Inc., 6500 N. Clark, Chicago, Ill. 60626
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Curtis Dyna Products Corporation, P.O. Box 297, Westfield, Indiana 46074
Dyna Fogger, thermal fogger
BP-145, backpack sprayer, duster

Cushman, OMC-Lincoln, 1401 Cushman Drive, Lincoln, Nebraska 68512
Cushman turf care system, 12 hp and 18 hp gasoline vehicles for turf care

Cyclone Seeder Co., Inc., Urbana, Ind. 46990
Seeders

D

Dadco, P.O. Box 2086, Fresno, Calif. 93719
Dadco, battery clamps

Ross Daniels, Inc., 1720 Fuller Road, West Des Moines, Iowa
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Davey Tree Expert Co., Kent, Ohio 44240
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Mini-Sneaker®, 25 hp vibratory plow
scatback, 30 hp 4-wheel drive articulated loader

Deere and Co., John Deere Equipment, John Deere Administrative Center, John Deere Rd., Moline, Ill. 61265
JD 350 & 450, crawler; 42 and 65 hp; loader and log fork available
JD 760A& 860A, earth mover-scraper; 9.5 and 15 cu. yd.
JD 380 & 480A, forklifts; 4000-5000 lb. lift and 5000-6000 lb. lift
Mowers, rotary, flail; push, riding, self-propelled; side mounted cutter bar available
JD 70 & 170, skid steer loader; 25 and 37 hp
JD 820, grounds maintenance tractor, 31 hp; belly mounted mower, cuts 6 ft. swath
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Blades
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Chain Saws
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Our sprayers go un-noticed.

You'd never know they've been there. 'Til you see the spray results. Then you realize the performance capabilities of Myers TL10E2 Turf Sprayers. Plus their gentle nature. Standard equipped with dual "Pillows of Air" Terra Tires. For minimum ground compaction. Only 14.1 PSI. Standard 21′ boom also. For turf maintenance in parks, golf courses, etc. Engine powered. Du-All 10 GPM, 20 to 500 PSI spray pump for full range chemical applications. Also available – skid model with live hose reel for insect, weed and sanitary operations.

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JD 302, tractor, 50 hp, utility loader, 50 hp
JD 302A, loader, 50 hp, loader/backhoe, 50 hp
JD 401 B, tractor, utility loader
JD 401 C, loader, loader/backhoe

Delavan Mfg. Co., 811—Fourth St., West Des Moines, Iowa 50265
Nozzles, all conceivable types, sizes and spray angles
Accessories, boom control valves, pressure relief valves, strainers, agitators and spray guns
Pumps, roller, turbine, piston

DESA Industries, Inc., 25000 S. Western Ave., Park Forest, Ill. 60466
Remington, gasoline chain saws, electric chain saws, pneumatic chain saws

Dico Co., Inc., P.O. Box 1344, Des Moines, Iowa 50305
Dico, Knuckle boom log loaders, trolley boom hoists

Digz-All Trencher Co., Div. Wing King Co., Merril, Iowa 51038
Digz-All, trenchers

DriAll, Inc., P.O. Box 309, Attica, Ind. 47918
Air Curtain Destructor, pit incinerator for disposal of trees and wood products—air pollution approved
Scarifier Levler, leveling device with scarifying teeth for landscapers, sod growers
Yard Levler, leveling or grading drag

Dunlop Tire & Rubber Corp. Box 1109, Buffalo, N.Y. 14240
Dunlop tires, for cars and trucks, tractors and implements

E

ESB Brands, Inc., Willard, Exide, Box 6949, Cleveland, Ohio 44101
Willard and Exide batteries, 6-volt electric golf car and golf utility vehicle batteries. Lead acid storage batteries for lawn and garden tractors
ESB Battery Chargers

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E-Z Go Golf Car, X-440 electric 3-wheel, GX-440 gas 3-wheel, X-444 electric 4-wheel, GX-444 gas 4-wheel

E-Z Rake, Inc., 1001 S. Ransdell Road, Lebanon, Indiana 46052
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Eagle cans, gasoline cans manufactured to meet OSHA regulations

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Echo Chain Saws, full range of chain saws from CS302, 3000 unit to CS100, 100cc unit
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Echo Duster/Mist Blower, compact, light weight knapsack type blower, 40cc engine
Echo Swing Scythe, lightweight, shoulder type, 20cc engine

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Economy, man-size all-gear tractor, 14 hp
Mower, rotary, mounted under tractor, 60 inches

Edwards Manufacturing Company, Rte. No. Box 1275, Ponca City, Oklahoma 74601
Edwards Sprayers, power sprayers, 50, 100, 200, 300, 400, 500, 1,000 gallons; 3 to 50 hp engines

Erickson Corp., 211 St. Anthony Blvd., N.E., Minneapolis, Minn. 55418
Erickson, hydrostatic drive compact front end loader

Eversman Mfg. Co., Curtis at Fifth St., Denver, Colo. 80204
Eversman, land leveler

Excel Industries, Inc., P.O. Box 385, Hesston, Kansas 67062
Hustler, mower, rotary Model 272, 18 hp, dual hydrostatic transmission, 72-inch cut, winter attachments available
Hillside Hustler, mower, rotary, 24 hp, dual hydrostatic, Model 360, self-leveling for maximum safety and performance on hillsides and level ground; 60-inch flail, too

F

FMC Corporation—AMD,5601 E. Highland Dr., Jonesboro, Arkansas 72401
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FMC Corporation, Municipal/Industrial Service Equipment Division, 1201 E. Lexington St., Pomona, Calif. 91773
Wayne Stump King and Wayne Brush Chipper

FMC Corporation, Outdoor Power Equipment Div., 215 South Park Street, Port Washington, Wis. 53074
HT-20, tractor, garden, hydrostatic, twin cylinder, 19.5 hp 54-inch rotary mower, 48-inch two-stage snow thrower
QT-16, tractor, garden, hydrostatic drive, twin cylinder 16 hp, 48-inch rotary mower
QS-16, tractor, garden, hydrostatic drive, 48-inch rotary mower, 16 hp
H-14, tractor, garden, hydrostatic drive, 14 hp 42-inch rotary mower
G-14, tractor, garden, 14 hp, 42-inch rotary mower
G-10, tractor, garden, 10 hp, 38-inch rotary mower
G-8, tractor, lawn, 8 hp, 32-inch rotary mower
828,829, mower, riding, 8 hp, electric and recoil start, 28-inch rotary
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Fayette Division, Dayton-Walther Corporation, P.O. Box 8, Fayette, Ohio 43521
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Ferti-Feeder, tree deep root fertilizer injector

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Finn Hydroseeder, seed and fertilizer spreader
Finn Klodbuster, slope harrow

Flintkote Co., The Pipe Products Div., Box 151, Ravenna, Ohio 44266
PVC pipe

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Flymo, air-cushion rotary mower

Foamspray Chemicals, Inc., 10414 Harry Hines Blvd., Dallas, Texas 75220
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Chain saw grinder, sharpen saw chains

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Ford rotary cutters, 60, 72, 84 and 100-inch widths
Ford sickle barmowers, 5, 6 or 7 ft. widths

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Friend Commander, chemical applicators, granular, chemical
Champion and Chapin, chemical applicators, dusters
Friend Orchardkraft, generators, hose, hydraulic and air-powered tools
Friend Parkkraft, litter receptacles
Wilson, dust masks
Friend, mistblowers, nozzle parts
Uniroyal, protective clothing
Friend Orchardkraft, pruners
Friend, pumps
Hannay, reels, hose
Wilson, respirators, safety equipment
New Draulics, saws, chain
Seymour Smith, saws, manual
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Friend, spray booms, spray guns, spray nozzles, complete, disk whirls
Friend, spray pumps, sprayer, bifluid, boom
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G

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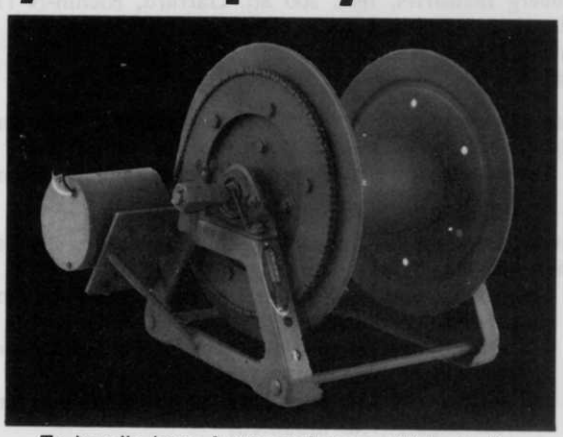

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Gandy Line Tender, granular applicator; 1 to 21-inch band, handle control
Gandy Super/Junior, Granular applicator; 1 to 21-inch band, implement-mounted
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812 4-wheel tractor, 8-spd. trans., 12 hp Kohler single cylinder engine (rear mounted)
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Safe-T-Rain, impact and pop-up sprinklers

Hays Spray Gun Co., 98 N. San Gabriel Blvd., Pasadena, Calif.
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diana 46947

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Hortiscape Landscape Border Edging

Hortiscape Tree Guying units

Howard Rotavator Co., Inc., 343 S. Division, Box 100 Harvard, Ill. 60033

Howard Turf Quakers, turf aerification machines

Howard Rotavators, rotary tillage equipment

Howard Power Arms, 3-pt. linkage backhoes

Hub States Corporation, 2000 North Illinois Street, Indianapolis, Ind. 46202

520 sprayer, gas powered, high pressure

702 sprayer, electric powered, volume

730 sprayer, electric powered, high pressure

970 sprayer, gas powered, volume

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H. D. Hudson Manufacturing Company, 154 E. Erie St., Chicago, Illinois 60611

Hudson manually-operated sprayers, compressed air, 1-1/3 to 4 gallons, steel and polyethylene tank; knapsack, 4½ to 5 gallons; slide-pump; wheelbarrow, 17½ gallons; barrel and bucket spray-pumps; intermittent and continuous plunger-operated, 5 oz. to 2-2/3 qts.

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Hudson PTO pump kits, positive piston, roller

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Hudson power sprayer accessories, guns, booms, trailers (fixed and adjustable tread), tanks, tractor barrel mounts, wheels, cab top, elevated operator platform, telescopic gun mast, nozzles, boom drops, boom control valves, hose, hose clamps, hose fittings, tank refiller, pressure gauges, hose reels, pressure regulators, root feeder, flower gun, 3-nozzle gun, lawn booms

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HPC, submersible and vertical turbine pumps for deep wells and pressure booster applications for irrigation applications

Hydro-Turf, P.O. Box 3, Elk Grove, Ill. 60007

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International Harvester (Consumer Products) 401 N. Michigan Ave., Chicago, Ill. 60611
International, lawn and garden tractor
Cub Cadet, Cadet 55 and 75, riding mower
Cadet 76, lawn and garden tractor
International 526, rotary tiller
International 95, electric riding mower
International 265 & 268, snowblower
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Irrometer Company, Inc., P.O. Box 2424, Riverside Calif. 92506
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J

JLM Products & Design, 6805 Boysenberry Way, Colorado, Springs, Colo. 80907
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Edgers
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Work Horse Terra-blade, for compact tractors
Work Horse Forklift, for compact tractors
Work Horse Terra-comb, for compact tractors

K

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Kaster, spreader, broadcast, fertilizer, seed, lawn
Krawler, sprinkler, traveling, lawn

Kemp Shredder Co., 1027 E. 26th St., Erie, Pa. 16505
Shredders

Kinco Mfg., 2368 Territorial Road, St. Paul, Minnesota 55114
Kinco KMG 38, sickle bar mower
Henderson GPM, verti-cut and flail-type mower

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Hodges, stump router (territory E. of Mississippi)
Seymour Smith, pruners
Fanno, saws
Greenlee, tools
Carhartt, uniforms
Little Wonder, pruners
Champion, pruners
Skod, saws and pruners
B.V.D., saws and pruners
Standard, brooms
Wall Rope Co., rope
Klein, tools
Whitlock—Plymouth, rope

L

Lakes Supply Co., Inc., P.O. Box 101 Dundee, Ill. 60118
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Western, snow plows
Toro, lawn mowers
Huffy, lawn mowers and riders
Hahn Eclipse, lawn mowers and riders
Jacobsen, lawn mowers and riders
Ariens, lawn mowers and riders

Lakeshore Equipment & Supply Co., 10237 Berea Rd., Cleveland, Ohio 44102
Replacement parts, mowers
Golf accessories, flags, cups, etc.

Lakeside Mfg. Company, Inc., 39 E. Main St., Honeoye, N.Y. 14471
Trailers, industrial, 6 to 15-ton rated capacity

Lancaster Pump & Mfg. Co., Inc., 1340 Manheim Pike, Lancaster, Pa. 17604
Saws, chain, five models, 8½-15 lbs. weight, 12-24-inch bar lengths, manual and dual system chain oiler

L. L. Larson Machine, Inc., 1017 N. Santa Fe, P.O. Box 308, Princeville, Illinois 61559
Sprayer pump, piston, roller & centrifugal
Portable water pumps, centrifugal, roller & piston
Sprayer nozzles, broadcast & hi pressure
Sprayers for ground coverage, broadcast & spot application
Sprayers for trees, 20 ft. x 50 ft. application
Sprayers for turfs, broadcast & spot application
Sprayers, fertilizer-mounted, broadcast & spot application
Spreaders, fertilizer, pull-type, broadcast 40 ft. pattern

Lauson Power Products, Engine Div. Tecumseh Prod. Co., 900 North St., Grafton, Wis. 53024
Engines 2 to 16 hp, vertical and horizontal shaft, trans axles, transmissions, differentials, hydrostatic units

Lawn-Boy, OMC-Lincoln, P.O. Box 82409, Lincoln, Nebraska 68501
Lawn-Boy, solid state ignition rotary mowers, deluxe model rotary mowers

Lawn Medic, Inc., Manufacturing & Research, Gates Street, Bergen, New York 14416
Porto-Mixer, hand-operated small 1 c.y. portable tumbler

Lehara Equipment Co., Inc., 60 East 42nd St., New York, N.Y. 10017
Lehara Hy-Dro Flail, hydraulic extension mower—for mowing behind guard rails, up and down banks

The Lely Corporation, P.O. Box 1060, Wilson, N.C. 27893
Lely Broadcaster/Seeder, P.T.O. driven, lift and pull-type spreads fertilizer, seed, sand or chemicals
Lely Roterra, P.T.O. driven power harrow, prepares seedbed, incorporates chemicals, levels land

Levco Manufacturers, Inc., P.O. Box 72, Wynne, Arkansas 72396
Model HD50 Stump Grinder, a one-man stump removal system offering unequalled maneuverability and speed; operates behind a standard pickup truck (½-ton) or small tractor; features include industrial, water-cooled power unit and self-contained hydraulic system

Fred A. Lewis Company, 40 Belknap Rd., Medford, Oregon 97501
Lewis "Mole", post hole digger powered by chain saw motor
Lewis "Donkey" Winch, winch powered by your chain saw
Lewis Tractor "Mole", post hole digger attachment to small tractors (front end attachment)

Lifetime Career Schools, 2251 Barry Ave., Los Angeles, Calif. 90064
Landscape training, complete home study training in landscaping and ground care; free booklet describes training in detail

Lift-Quik Mfg. Co., South Main St., Evans Mills, N. Y. 13637
Lift-Quik, garden, golf cart, lift

Limb-Lopper Co., Inc., 11845 E. Burke, Santa Fe Springs, Calif. 90670
Limb-lopper, pruner, hydraulic and air, saw, chain hydraulic and air; saw, circular, hydraulic and air
Powerench, impact wrench, hydraulic
Powerbore, drill, Hydraulic; tamper, hydraulic

Lindell Industries, Div. of Lindell Pattern Works, 2689 So. 10th St., Fresno, Calif. 93725
Sweeper, vacuum; yard
Blower, leaf blower (wind-row)
Edger/trimmer, lawn

Lindig Manufacturing Corporation, 1875 West County Rd. C, St. Paul, Minnesota 55113
Lindig, shredders (soil and compost)—manual and tractor fed, capacity up to 200 yards/hour; screeners (powered) for soil and sand; brush chippers, 7 to 160 hp, compact and full size for branches up to 8" in diameter, also PTO drive; soil treating (sterilization) systems; leaf shredders and compost pulverizer/mixers
Lindig Kajon, compact brush chippers 7 to 10 hp
Lindig Concho, compost shredder/grinder
Lindig Apache, shredder/bagger for leaves and yard debris

Locke Mfg. Div. Stellar Lawn Care, 1085 Connecticut Ave., Bridgeport, Conn. 06607
Mowers, reel, self-propelled and riding, 30 inches to 87 inches; rotary

Lockwood Corporation, Box 160, Gering, Nebr. 69341
Lockwood Hardie Sprayers, airblast sprayer, 300 or 500 gallon stainless steel tank, trailer mount; utility (general purpose) 100 to 500 gallon stainless steel tanks. Truck trailer or skid mounted; shade tree—600 gallon stainless steel tank, truck mounted

Lombard Power Equipment, Sales Ave., Harrison, Ohio 45030
1500 electric, saw, chain, 12-inch bar; 12 amps
Pony, saw, chain, gasoline, 12-inch bar, 6½ lbs.
Comango, saw, chain, gasoline, 16-inch bar
Super comango, saw, chain, gasoline, ½" anti-vibe," automatic oiler
Super Lightning, saw, chain, gasoline, ½ "anti-vibe,"

automatic oiler, 20-inch bar; saw, chain, gasoline, full "anti-vibe," automatic oiler

London Fog Company, Crystal Bay, Minnesota 55323
London Foggers, thermal foggers from 3 hp hand portable through 16 hp heavy-duty
London Aire, ULV insecticide dispersal equipment from 5 hp dolly mounted type through 9 hp extra heavy-duty for large area mosquito control

Lumenite Electric Co., 2331 N. 17th Ave., Franklin Park, Ill. 60131
Lumenite, lawn irrigation control and equipment

Lundin-Milner, Inc., Los Altos, California
Chipper, will handle up to 3-inch diameter material, pull-type, stationary, mounted, electric, gas, PTO powered

Lupton Enterprises, 32 Martha St., Tiffin, Ohio 44883
Log splitter, attachment to hackhoe, replaces bucket in minutes

M

M-B Company, New Holstein, Wis. 53061
Brush Chippers, trailer mounted—12" and 15" sizes 120-158 hp gasoline engines
Orchard Chipper, tractor 3-point hitch attached PTO driven (540 RPM), 12" wide chipper with feed apron and 180° discharge chute
1-10, 3-10, 5-10, line marker, hand operated
Fitchburg chipper, brush chipper 12 in. and 15 in.
Tractor Brooms, sweepers

Maasdam Pow'r Pull, Inc., P.O. Box 6130, Burbank, Calif. 91510
Maasdam Pow'r Pull, winch-puller

Magline, Inc., 503 S. Mercer, Pinconning, Mich. 48650
Trailevator®, trailer, hydraulic elevating

Mars Industries, Inc., 5209 West Broadway, Minneapolis, Minn. 55429
Mars Chem-Spray, turf sprayer, 5 gal. capacity
Surbuban Angle Broom, tractor attachable rotary sweepers
Suburban Pick-up sweepers, tow-type turf pick-up sweepers

Martindale Electric Co., 1375 Hird Ave., Cleveland, Ohio 44107
Martindale Protective Mask, respiratory protection against non-toxic dusts
Martindale Protective Eyeshield, one-piece eyeshield

Massey-Ferguson, Inc., (Industrial Products) 1901 Bell Ave., Des Moines, Iowa 50315
MF 20, industrial tractor, 38 hp
MF 30, Industrial tractor, 52 hp
MF 40, industrial tractor, 38 hp
MF 20 Turf, industrial tractor, 38 hp
MF 30 Turf, industrial tractor, 52 hp
MF 20, 30, 40, 50A, 70, backhoe-loader; ⅝ cu. yd., ¾ cu. yd., ⅝ cu. yd., 1 cu. yd. respectively; up to 16 ft. digging reach; all but MF 70 available separately
MF 711, skid steer loader
MF 2200, forklift
MF 2500, forklift
Box scraper, landscape

Massey-Ferguson, Inc., (farm equipment), 1901 Bell Ave., Des Moines, Iowa 50315
MF 135, tractor, 38 hp (PTO)
MF 165, tractor, 50 hp (PTO)
MF 175, tractor, 63 hp (PTO)
MF 180, tractor, 63 hp (PTO)
MF 1080, tractor, 80 hp (PTO)
MF 1105, tractor, 100 hp (PTO)
MF 1135, tractor, 120 hp (PTO)
MF 1155, tractor, 140 hp (PTO)
MF 1500, tractor, 150 hp (drawbar)
MF 1800, tractor, 180 hp (drawbar)

Massey-Ferguson, Inc., (consumer products), 1901 Bell Ave., Des Moines, Iowa 50315
MF 14, garden tractor, 14 hp
MF 126, garden tractor, 12 hp
MF 10, garden tractor, 10 hp
MF 310, self-propelled rotary mower, 3.5 hp
MF 210, push rotary mower, 3.5 hp
MF 58, 68, 61, 71, rotary cutters, cutting widths up to six feet

Mathews Company, P.O. Box 70, Crystal Lake, Ill. 60014
Lawn Genie, flail mower-sweeper-mulcher, 3 ft. and 6 ft. models

Maxey Manufacturing Co., Inc., P.O Box 2001, Ft. Collins, Colo. 80521
Barela's Roller, turf seed bed prep—crushes, levels, compacts and finishes
Trailers, equipment trailers—medium duty
Truck Bodies, customized truck beds

McCabe-Powers Body Co., 8900 N. Frost, St. Louis, Mo. 63115
Buckets, aerial towers

McCulloch Corp., 6101 W. Century Blvd., Los Angeles, Calif. 90045
Chain saws, (15 models)
Hedge trimmer
Portable earth drill
Portable electric generators, 1500, 2000 and 3000 watt
Brush cutter

McDonough Power Equipment, Inc., McDonough, Georgia 30253
Mower, rotary, push-type and riding; reel, self-propelled

Melnor, Turf Irrigation Div., 1 Carol Place, Moonachie, New Jersey 07074
Shrub nozzle adapters
Stationary spray heads
Pop-up spray heads
Rotary spray heads
Pulsating spray heads
Solenoid valves
Time controls
Quick coupler valves
Pipe and fittings

Melroe Division, Gwinner, North Dakota 58040
Melroe Bobcat, skid turn front end loader

Metro-chiper, Vestor Div., Morbark Ind., Winn, Mich. 48996
Chippers, for large tree chipping

Miller Tilt top Trailer, Inc., 450 S. &2 St., Milwaukee, Wis. 53214
Tilt Top®, machinery hauling trailer, changes quickly from between the wheel to over the wheel trailer
Ramp Champ®, over-the-wheel platform trailer; both trailers available with new gooseneck hitches

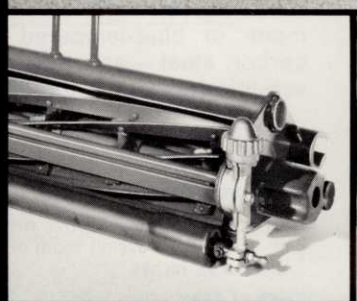
Mitts & Merrill, Inc., 109 McCoskry St., Saginaw, Michigan 48601
Chipper, brush, staggered knife pattern, swing away folding feed chute, positive safety lock pin

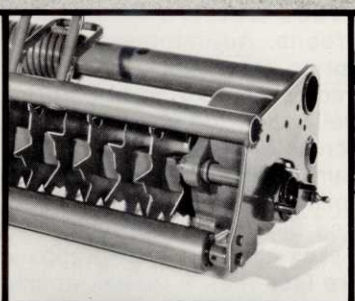
Mobile Aerial Towers, Inc., 2314 Bowser Avenue, Fort Wayne, Indiana 46803
Hi-Ranger, personnel platforms

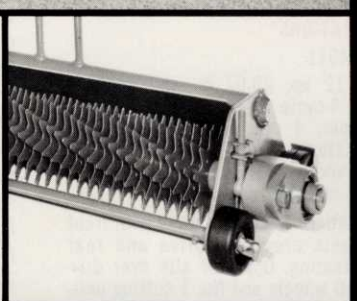
Moody Sprinkler Co., Inc., 3020 Pullman St., Costa Mesa, Calif. 92626

The great Greensmaster 3 still has no equal.

And now it's the best spiker and thatcher, too.







1 AS A GREENSMOWER, the high capacity Greensmaster 3 is the basic machine in the Toro greens-maintenance system. Exclusive features like the balanced, fully floating cutting heads—isolated from the traction unit and the grass baskets—give a uniform cutting height, appearance and playing characteristic to each and every green. Proven history of performance on fine greens all over the world lets you be confident of the real value of Greensmaster 3. (See back of page for complete features, benefits and specs.)

2 AS A SPIKER, the Greensmaster 3 is actually superior to specialty machines. Spiker units replace the three cutting units, penetrate turf up to 1¼ in. deep to relieve surface compaction, deliver water, fertilizer and chemicals quickly to root zones, and slice stolons and/or rhizomes—encouraging the production of new, young shoots. 57″ working width makes spiking practical and efficient for the first time. Toro blade design doesn't ruffle turf. Greens are playable right after spiking.

3 AS A THATCHER, the Greensmaster 3, once again, does a better job than specialty or accessory units. Three thatching units easily replace cutting units. Tempered steel blades are arranged in a spiral pattern to do more work with less power. Variable blade spacing (as close as ½ inch) permits adjustment to meet varying turf conditions. 59″ working width makes vertical mowing practical and efficient for the first time. Result: grain control and elimination of thatch buildup for healthier greens and more consistent playability.

TORO® | GREENSMASTER® 3

TORO® GREENSMASTER® 3

1 AS A GREENSMOWER, the features and benefits include:

Balanced, fully-floating cutting heads — isolated from the traction unit and grass baskets — give uniform cutting height from first green to the last (a Toro exclusive). Low pull point on all cutting units for straight, even tracking. 15-inch turning radius for greater maneuverability, faster handling. Low-noise fully-hydraulic drive is smooth and easy on the greens. Maximum operator visibility and ease of control. Exclusive interchangeable wheels, cutting units, baskets, reel drive motors save time, money invested in stocking parts. Customizing accessories for varying conditions — including a simply engineered and easy to install individual reel shut-off kit that controls the front two cutting units to give a variable track on the clean-up run. Optional reel roller scrapers minimize grass build-up for a beautiful appearance even on wet turf. Proven history of performance on fine greens all over the world lets you be confident of the real value of Greensmaster 3.

SPECIFICATIONS*

Model 04311

Engine: 12 hp, 29.07 cu. in., dynamic balance, 4-cycle with dry paper element air cleaner, 4 pint lubrication system, electric starting with 12 volt lead-acid battery, and 5 gallon fuel capacity. Hour meter is standard equipment.

Configuration: Tricycle vehicle with front two wheels providing drive and rear wheel steering. Operator sits over driving (front) wheels and No. 1 cutting unit, with No. 2 and 3 cutting units in front of vehicle.

Traction Drive: Direct driven hydraulic pump through stack valve to orbital gear motors which directly drive wheels.

Cutting Unit Drive: Belt driven hydraulic triple pump through stack valve to gear motors which directly drive reels.

Speeds: (approx.) (3300 RPM Engine) 1st — 3.7 m.p.h. 2nd — 7.0 m.p.h. Rev. — 3.7 m.p.h. Reels — 1800 RPM.

Clip: .27 approx.

Brakes: Two 6" drum type mechanical with pawl and ratchet lock for parking.

Tires: (3) 18 x 9.50 x 8, 2-ply pneumatic tubeless demountable and interchangeable.

Tire Pressure: 8 psi front; 12 psi rear.

Oil Reservoir: 6 gal. capacity with diagonal baffle to separate suction side from return side.

Wheel Bearings: Drive Wheels: needle bearings provided in wheel motors. Caster wheels: Timken tapered-roller.

Cutting Units: Reel diameter: 5". Height of cut: 3/16" to 1 1/16". (1/8" with thin bed knife.)

Reel Construction: 8 blades riveted to 5 cast spiders. **Power:** Hydraulic motor splined to reel shaft. **Bearings:** Timken tapered-roller. **Bedknife Adjustment:** Opposed screw. **Roller Adjustment:** Front: micrometer hand adjustment with bolted clamp lock (1 turn=.025" H.O.C. change). Rear: pivot-arm quick change with spring actuated tapered-pin lock (.21" H.O.C. change). Slotted plate with locking screw for roller/reel parallelism.

General Specifications: Width of cut: 59". Wheel tread: 49½". Wheel base: 45½". Turning radius: 15" uncut radius. Overall length: 87½". Overall width: 69¾". Overall height: 50¼". Net weight (with all fluids): 1080 lbs.

Optional Equipment: Full Roller Kit (Model 04412), Wiehle Roller Kit (Model 04413), Swedged Roller Kit (Model 04414), Rear Roller Cleaners (Model 04417), 1/8" Height of Cut Bedknives, Individual Reel Shut-Off (2 reels only).

2 AS A SPIKER, the features and benefits include:

Special Toro profile-tooth spike blade that spikes cleanly without ruffling turf (greens are playable immediately after spiking — no rolling or cutting needed). Power driven reels with one-way slip clutch give added traction on sloping greens. Adjustable transfer spring transfers weight from traction unit to spiking reels. Delivers up to 650 lbs. of weight across 57 inch width for maximum 1¼ inch penetration. Wide spiking area gets more done in less time — you can spike as fast as you mow. And the spikes are less than 2 inches apart. A depth measuring tool is included with each set of spiker units to insure effectiveness of treatment under varying conditions.

SPECIFICATIONS*

Model 04420

Unit Working Width: Effective width per unit — 19 inches; overall width of set of 3 units — 57 inches.

Downward Force: Basic unit weighs 84 lbs. per unit (252 lbs. for set of 3). Available override spring transfers weight from basic traction unit to spiker head.

Min. downward force: 84 lbs./unit (8.4 lbs./blade)

Max. downward force: 220 lbs./unit (22.0 lbs./blade)

Performance: Spiker penetration — up to 1¼ inch; gauged by supporting rollers.

Number of spike holes — 26½ holes/ft. sq.

Spiker Blades: Blades high carbon steel — .105 inch thick. Special profile design for minimum disturbance of soil surface when spiking.

8 points per blade, 10 blades per unit (30 blades per set), 7¾ dia. blade point to point.

Power: Spiker powered by Greensmaster 3 reel drive motors; reel motors drive gear box — 12:1 speed reduction; output speed—150 RPM; gear box contains one-way slip clutch for "free wheeling" in forward direction; powered spiker unit assists basic traction unit when required.

3 AS A THATCHER, the features and benefits include:

Reels cut in forward rotation for efficient vertical mowing. Spiral pattern of thatcher blades means less wear on drive motors, more efficient thatching and throwing of thatch into basket. Adjustable gauge wheels tailor cut to various turf conditions. Variable blade spacing (as close as ½ inch — depending on the need) permits adjustment to meet varying turf conditions. Gauge plates are provided for easy bench setting of penetration depth, 59" working width makes vertical mowing practical and efficient for the first time. High strength blades are made of blue-tempered high carbon steel — and they're reversible for double the life.

SPECIFICATIONS*

Model 04416

Reel Diameter: 5".

Unit Working Width: Effective width per unit — 20 inches; overall width of set of 3 units — 59 inches.

Depth of Penetration: Infinitely variable, up to a maximum depth of ¼".

Reel Construction: Flat hardened steel blades spaced between various combinations of ¼" spacers. Spacings between blades to vary from ½" to 1½". Set at ½" spacing at factory.

Power: Hydraulic motor splined to thatcher reel shaft.

Bearings: 1-inch shaft ball bearings retained in cast iron bearing housings.

Reel Adjustment: Pivoting shaft in slotted main frame.

Grass Shield Adjustment: Four bolt mounted shield. Slotted mounting straps for adjustment to reel to regulate throw characteristics.

*Specifications and design subject to change without notice.

Toro is an exclusive trademark of The Toro Company.

Rainmaster, automatic valves, electric and hydraulic; automatic controllers, electric and hydraulic; sprinklers—pop-up and stationary heads

Morbark Industries, Inc., P.O. Box 1000, Winn, Michigan 48896
Morbark Total Chiparvestor, disc type chipper reduces whole trees, limbs in tact, up to 21" diameter in less than a minute.

Mott Corporation, 500 Shawmut Ave., LaGrange, Illinois 60525
Mott Hammer Knife, safety flail mower

MTD Products, Inc., 5389 W. 130 St., Cleveland, Ohio 44111
Rotary Vacuum Shredder Bagger, 5 hp, 3 stage cutting action blade

Mud Cat, Div. of National Car Rental, 5501 Green Valley Dr., Minneapolis, Minn. 55431
Weed harvester, aquatic

The F. E. Myers & Bro. Co., 400 Orange Street, Ashland, Ohio 44805
Turf Line, TL 10 E2 10 GPM-500 PSI 200 gallon — paddle agitator; TL 10 E2S 10 GPM-500 PSI 200 gallon—skid model; TL 35 E5 35 GPM-800 PSI 500 gallon—engine—rotary agitator; TL 29 100 GPM-29" fan—150 gallon—engine—mist sprayer

N

National Foam System, Inc., Parco Div., 150 Gordon Drive, Lionville, Pa. 19353
Dragon Model 180, back pack 5 gallon sprayer

National Hydro-Ax, Inc., Box 568, Owatonna, Minnesota 55060
Hydro-Ax Brush Cutter, 117 hp 4-wheel drive articulate steering and rough terrain vehicle

National Mower Co., 700 Raymond, St. Paul, Minn.55114
National, 84" National Triplex Reel, 10 hp riding Reel; 68" National Triplex Reel, 10 hp riding reel; 68" National Triplex Reel, 8 hp; 30" National Triplex Reel, 8 hp riding reel

Nelco, Inc., 2712 S. W. Freeway, Suite 118, Houston, Texas 77006
Pipe, irrigation through microporous openings

L. R. Nelson Corporation, 7719 N. Pioneer Lane, Peoria, Illinois 61614
Rain Train, traveling sprinklers
Silver Rain, pop-up sprinklers, landscape and turf irrigation equipment

Nunes Manufacturing, 2006 Loquot Avenue, Patterson, California 95363
Nunes Sod Harvester, complete mechanical sod harvester; mounted on Ford Model 4110 tractor; front cutoff and cutter assembly; will eliminate sod cutter labor; available in styles to: fold, slab, roll, sod.
Nunes Vacuum Sweeper, turf sweeper designed for sod growers; available with PTO drive or motor driven

O

Oberdorfer Foundries, Inc., Agri. Pump Div., Thompson Rd., Syracuse, N.Y. 13201
Pumps, bronze and aluminum, rotary gear, rubber impeller, rubber cotlar, centrifugal, helical rotor

Olathe Mfg., Inc., 2nd and Mullberry, Paola, Kansas 66071
Olathe Model 800 Quiet Chipper, brush, limb and lumber chipper with new patent pending noise control features
Model 8 Stump Cutter, portable stump remover, 8 hp
Model 12 Chipper, 3-pt. hitch PTO powered brush chipper
Model 172 and 330 pers, trailer mounted engine powered brush chippers
Model 400 hydraulic power unit, 8 hp portable hydraulic power unit

Omark Industries, Inc., Oregon Saw Chain Division, 9701 S. E. McLoughlin Blvd., Portland, Oregon 97222
Oregon Saw Chain, saw chain and accessory items
Oregon Power Mate and Super-tronic saw bars
Oregon Power Mate, rim and drum sprockets

Onan Division of Onan Corp., 1400 73 rd Ave. N.E., Minneapolis, Minn. 55432
Engines, 12-25 hp air-cooled engine gasoline electric portable generators, 1000 watts-15,000 watts
Porta Charge™, golf car portable electric generator, 1500 watts

Otis Elevator Company—Special Vehicle Division, P.O. Box 8600, Stockton, Calif. 95208
Otis Golf Car, electric, 4-wheel, 36 volt
Otis Turf-Awl, gasoline, 3 and 4-wheel, 18 hp

Otis Materials Handling, 8000 Baker, Cleveland, Ohio
Forklifts

P

Papec machine Co., Shortsville, N.Y. 14548
Leaf blower

Par Aide Products Co., 296 No. Pascal Street, St. Paul, Minnesota 55104
Complete Line of Greens and Tee Accessories equipment including: golf ballwashers, flag poles and flags, tee towels, detergent for golf ballwashers, aluminum and plastic putting cups, hole cutters, cup setter, cup puller, rule signs, custom tee plaques, furniture for locker room and tee benches; spike rushes, sand trap rakes, etc.

Parker Sweeper Company, Box 720, Springfield, Ohio 45501
Estate Master, 3-gang sweeper for turf or large area cleanup
Hurricane Blowers, for windrowing leaves etc. for easy collection
Trail Thatch, a large three-gang Thatch-O-Matic for dethatching large areas

Partner Industries of America, Inc., 2733 W. Fulton, Chicago, Ill. 60612
Saws, chain, six models, 10½-17 lbs. weight, automatic chain oiler

Perma-Rain Irrigation, Inc., P.O. Box 880, Lindsay, Calif. 93247
Filter, sand, silt, alge etc. (irrigation)
Emitter, "E1" for irrigation—trees/shrubs; "Perma-Flo E1"
Fogger, Perma-Rain, for tree and shrub irrigation and plant cooling

Pioneer, OMC-Lincoln, P.O. Box 82409, Lincoln, Nebraska 68501
Pioneer P 40, 4.0 cu. inch engine chain saw for professional use
Pioneer P 20, 3.1 cu. inch displacement chain saw for casual use
Pioneer P25, 3.1 cu. inch displacement chain saw for casual use
Pioneer 1200 A, 3,546 cu. inch displacement chain saw

Piper Aircraft, Bald Eagle Street, Lock Haven, Pa. 17745
Aircraft, fixed wing

Piqua Engineering, Inc., 234 First St., Piqua, Ohio 45356
Lickity, brush chippers, log splitters, can compactors

Pitman Manufacturing Co., Div. A. B. Chance Co., P.O. Box 120, Grandview, Mo. 64030

Mobilift, aerial bucket

Plasti-Chain Corporation, P.O. Box 267, Hebron, Illinois 60034
Plasti-Chain Polymer Chain and Plastic Chain and Steel re-inforced ground and Ground Post, corner posts for use around golf course tees, cart pathways, etc.; connecting links and S-hooks also available; each of 2 sizes in chain and all-purpose posts available in white and black; chain available also in blue, red, green, and yellow
Estate Fencing, plastic chain and steel re-inforced posts pre-packaged as follows: Master Kit, contains 10 posts, 85½ feet of chain packed in 9½ foot lengths, available in black, white, or combinations; ideal for lining a sidewalk, enclosing a patio, garden, etc.—Driveway Pack Kit, contains 6 posts, 47½ feet of chain, packed in five 9½-foot lengths; available in black, white, or combinations; ideal for lining a driveway—Corner Pack Kit, contains 3 posts and two 9½-foot lengths of chain; available in black, white, or in combinations; perfect for fencing off restricted areas or to indicate danger areas
Guideline Lane Equipment, available in 40-inch high/2½-inch diameter, heavy duty "base" post; in black, or white supplemented by two sizes of plastic chain available in black, white, red, blue, green, or yellow; connecting links and S-hooks also available by color; this all Guideline Lane Equipment is ideally suited for directing crowds at all indoor functions, outdoors in parking lots or at field events, or where ever people gather; easy to set up, move, remove, or store; permanently attractive, requires no maintenance

Plastic Techniques, Inc., New Boston, N.H. 03070
Plastic Techniques, aerial lift truck accessories

Plastiline, Inc., 1251 N.E. 45 St., Pompano Beach, Fla. 33061
Polyethelene (plastic) fittings

H. K. Porter, Inc., 74 Foley St., Somerville, Mass. 02143
Cutters, bolt, rod, cable, chain, etc.
Shears, lopping
Trimmers, tree
Shears, pruning
Cutters, brush and root

Beaird-Poulan Division, Emerson Electric Co., 5020 Flournoy-Lucas Rd., Shreveport, La. 71109
Poulan, gasoline chain saws; electric chain saws

Power Spike Mfg. Co., Walters, Okla. 73572
Power Spike, spiker

Precision Chipper Corporation, Box 360, Leeds, Ala. 35094
Chipper, heavy-duty, industrial, feed through rate of about 125 feet per minute

Princeton Manufacturing Co., P.O. Box No. 1, 360 W. Waterloo Street, Canal Winchester, Ohio 43110
Princeton Sod Harvester, self-propelled harvester, cuts and stacks sod on pallets

Product Development International, Box 676 Liberty, S.C. 29657
Tree-Injectors, systemic tree injection kit
Riggin'-Buddy, rigging device for tree workers
Magic Knot, mechanical fastener for rope tying
Quick Cablers, easy tree bracing system
Tool Holders, for holding tree workers tools on belts
Climber's Tie-In Strap, lightweight safety strap for tree climbers
Training Manuals, for all tree care people

Q

Quadra Mfg. Ltd., Box 491, Trail, B. C., Canada
Frontier, super-light weight chain saws

Quality Marsh International, P.O. Box 406, Thibodaux, La.
Quality, amphibious marsh and swamp equipment; amphibious draglines; amphibious personnel carriers; amphibious roto booms

R

RainBird Sprinkler Mfg. Corp., P.O. Box 37, Glendora, Calif. 91740
RainBird, impact sprinklers, spray heads, rotor pop-up sprinklers, electric valve-in-head sprinklers, hydraulic valve-in-head sprinklers, quick coupling valves, manual angle valves, electric remote control valves, hydraulic remote control valves, electric and hydraulic automatic controllers, specialty valves, valve markers, electric underground cable

Rain Jet Corporation, 301 S. Flower St., Burbank, Calif. 91503
Ssprinkler heads for irrigation
Shower head for club house

Rain-O-Mat Sprinklers, Inc., 12414 Whittier Blvd., Whittier, Calif. 90608
Sprinkler irrigation equipment

Raven industries, Box 1107, Sioux Falls, South Dakota 57101
Fiberglass tanks
Rhino polyethylene tanks

Reach-All Manufacturing and Engineering Co., 436 Calvary Road, Duluth, Minnesota 55803
Reach-All, hydraulically operated aerial baskets, truck mounted hydraulic cranes

Red Ewald, Inc., Box 1167, Karnes City, Texas 78118
50-gallon spray rig, the basic unit is 50-gallon fiberglass tank, skid, 5 hp engine, 6 roller pump, 25' hose and handgun, plumbing and regulator

Reinco, Inc., P.O. Box 584, Plainfield, New Jersey 07061
Reinco, Inc., hydrograssers, power mulchers

Rental Equip. Mfg. Co., 2778 So. Tejon, Englewood, Colo. 80110
Bluebird, lawn combers, A/K/A thatchers, dethatchers, lawn rakes, renovators and vertical mowers, 4 hp, 5 hp, 7 hp
Bluebird "1500", engine hoists, knockdown type
Bluebird "3000", engine hoists, towable type
Bluebird "Yardbird", utility crane
Bluebird, engine stands
Bluebird "F.20B", lawn comber, compact type, 5 hp

Ridge Plastics Co., Highway 18 East, P.O. Box 2205, Jonesboro, Arkansas 72401
Biaxially oriented HD plastic pipe, sub-irrigation

Robco, Inc., 2800 Bay Road, P.O. Box 5326, Redwood City, Calif. 94063
Robco—Hatsuta, back-pack mist blower, duster
Robco, high pressure piston pumps, 4 GPM to 28 GPM; Hand sprayers and hand dusters; High pressure vinyl spray hose

Rockwell International, 5001 North Rockwell Ave., Bethany, Oklahoma 73008
Rockwell Thrush Commander, agricultural aircraft, fixed wing

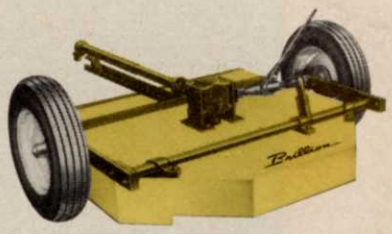
Rogers Bros., 100 Orchard St., Albion, Pa. 16401
Trailers

Roof Mfg., 1011 W. Howard St., Pontiac, Ill. 61764
Ranger, mower, self-propelled, tilt blade for heavy cutting, 5 hp or 7 hp, 24-inch or 26-inch cut
Roof 400, mower, push, blade clutch, 5 hp, 21-inch or 24-inch cut, belt driven blade

Root-Lowell Corporation, 1000 Foreman Road, Lowell, Michigan 49331

TERRA-SCAPER. The versatile landscape tool. It rakes, gathers, spreads. 6′ and 8′ models. Blade and scarifier optional.

MOW-SAFE FLAIL MOWER. New 72″ and 88″ width. Precise, safe mowing; won't throw objects. For 3-point Category I hitch.



60″ ROTARY MOWER. Mows grass, shreds weeds and brush. Rugged construction, safety shielded. Drawbar and pickup models.

Here's the system to perk up your public image.

These rugged Brillion tools make up a complete vegetation maintenance and control system. For soil preparation, seeding and mowing. On parkways or plant sites, public or private grounds. They get the work done quickly, in complete safety. And you'll find it easy staying within your grounds maintenance budget because repair bills just aren't a problem. Like all Brillion tools, these are built to do the toughest jobs, and keep on doing them year after year. Find out more. Send the coupon, or see your nearby Brillion dealer.

LANDSCAPE SEEDER. Pulverizes, seeds and rolls in one pass. Metered seeding gives thick stands on minimum seed. 4 bushel capacity, 5′4″ wide.

ROLLERS. Single or three-gang, 3′ to 12′ wide, up to 20′ with trailing gangs. Hefty and rugged, for fast smoothing and long life.

Brillion

VERSA-MOWER. Mows up to 15′ swath. Floating wings follow contours, lift hydraulically, fold and lock for travel.

BRILLION IRON WORKS
Dept. LI-41-123, Brillion, Wis. 54110

Please send information on:

- ○ Terra-Scaper
- ○ Landscape Seeders
- ○ Rollers
- ○ 60″ Rotary Mowers
- ○ Versa-Mower
- ○ Mow-Safe Flail Mower
- ○ I am a student

Name_____

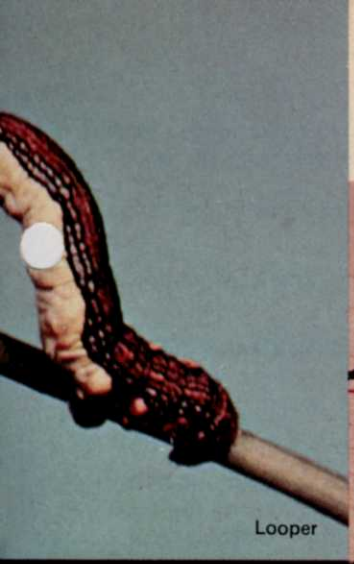
Address_____

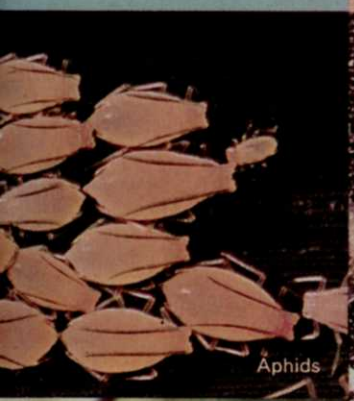
City_____ State_____ Zip_____

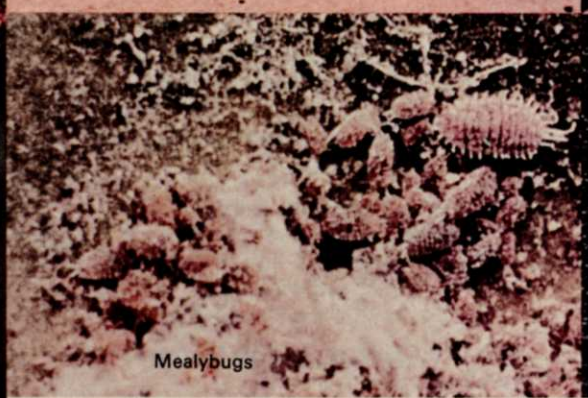
For More Details Circle (103) on Reply Card

1974 will be a bad year for bugs.

Bad for bugs of turf and ornamental plants. And bad for household and structural bugs. Because Dow has a pair of insecticides that will make their lives miserable. There's ZECTRAN* insecticide, a general use biodegradable insect killer that works on almost all major foliage-feeding insect pests—even the hard-to-kill kinds. Use ZECTRAN on over 600 different flowers, ground covers, trees, shrubs and turf. And then there's DURSBAN* insecticide. Its effectiveness, economy, non-phytotoxicity and biodegradability make it the choice of professional turf men for golf greens, turf farms, home and







Ag-Organics Department, Midland, Michigan 48640

industrial lawns—or wherever grass and ornamentals are grown. It's especially effective to control the hairy chinch bug and sod webworm. DURSBAN insecticide is also preferred by PCO's for controlling household and structural pests—especially resistant roaches that laugh at other sprays. Please remember to read and observe all precautions on the product label. Bugs, get ready for 1974!

*Trademark of The Dow Chemical Company

DOW*

DOW CHEMICAL U.S.A.

For More Details Circle (112) on Reply Card

Durapower, power sprayer: 10 gpm double piston pump @ 400 p.s.i., tanks 100, 200, 300 gallons
Spraycat, power sprayer: 3 gpm single piston pump @ 250 p.s.i., tanks 15, 30, 50 gallons

Roper Corporation, 1905 W. Court St., Kankakee, Ill. 60901
Saws, chain; manual and automatic; dual system chain oiler

Rosco Manufacturing Co., 3118 Snelling Ave., So., Minneapolis, Minn. 55406
Rollpac, steel wheeled roller, lawn, asphalt paths, etc.

Roseman Mower Corporation, 2300 Chestnut Avenue, Glenview, Illinois 60025
Roseman, mowers—gang reel, both mounted and hydraulic driven; tiller rake—landscape tiller rake

Roto-Hoe Co., Newberry, Ohio 44065
Cut 'N Shred, shredder, 3½ hp, interchangeable with tiller

Rowco Mfg. Co., Inc., 48 Emerald St., Keene, N.H. 03431
Brushking®, brushcutter, engine driven

Roxy-Bonner, Inc., 2000 Pioneer Rd., Huntingdon Valley, Pa. 19006
Roxy, mower reel, 25" and 28" cut
Lawnshear, mower reel, 21" cut
Ideal, mower reel, 30" cut

Royer Foundry & Machine Co., 158 Pringle St., Kingston, Pa. 18704
Royer Shredders, Models 362, 262, 180, 120, 12, 10, and 8
Power Screens, Models 30 and 42
Royer Chipper, Model 2600 PTO

Ryan, OMC-Lincoln, P.O. Box 82409, Lincoln, Nebraska 68512
Ryan turf equipment, full line of turf aerators, spikers, renovators

Joseph T. Ryerson & Son, Inc., P.O. Box 8000-A, Chicago, Ill. 60680
Landscape Edging, steel

S

Sabre Saw Chain, Inc., Third Ave. and Sabre Drive, Niagara Falls, N.Y. 14304
Sabre, saw chain, guide bars, sprockets, wedges, files, accessories

Safeline Products, P.O. Box 550, Putnam, Conn. 06260
Respirators (all types), lung protection
Safety Glasses and goggles, eye and face protection
Hearing protectors, muff-type and ear plugs
Hard hats and caps, plastic safety hats and caps

Safe-T-Lawn, Inc., 7800 N.W. 32nd St., Miami, Florida 33122
Safe-T-Rain, rotor pop-up (ball drive)
Rise-N-Rain, impact type pop-up
GL-67, 2" pop-up spray type
GL-71, 6" pop-up spray type

Safety Test & Equipment Co., Inc., P.O. Drawer 400, Shelby, North Carolina 28150
Wood/Chuck, manufacturer of Wood/Chipper capable of chipping logs up to 8" in diameter
Safety Test, manufacturer of complete line of tree trimming and linemen's equipment

Satoh Tractor c/o NEDA, P.O. Box 5025, Richmond, Va. 23220
S-650G, tractor, utility, 25 hp; water-cooled, 4-cylinder engine, category I—3-point linkage; 2-speed PTO, 540 and 1,000 rpm

Schutt's Equipment Co., P.O. Box 412, Birmingham, Mich. 48012
Schutt's Marvel Tree Diggers, front loader models from 18" to 60" ball sizes; Back hoe models from 18" to 36" ball sizes
Schutt's Root Pruners, 3-point hitch models from 16" to 22" ball sizes

E. R. Schwartz Mfg. Co., Box 248, Lester Prairie, Minn. 55354
Trailers, equipment

M. J. Scott, Co., 721 W. 2nd, Hutchinson, Kansas 67501
Grasshopper, rotary riding mower

Sea Guard, Inc., Delaware Trust Bldg., Wilmington, Del.
N-Bar®, floating barrier to hold back aquatic vegetation

Selma Trailer & Mfg. Co., P.O. Box 120, Selma, Calif. 93662
Aerial buckets—articulated boom lifts 20 to 55 feet from ground; telescoping bucket from 20 to 55 feet

Servis Equipment Company, 1000 Singleton, Dallas, Texas 75221
Servis Saturn, 5 rotary mower; 6 rotary mower; 7 rotary mower
Servis Cyclone, 60 rotary cutter; 72 rotary cutter
Servis flex, 15 rotary cutter
Servis Gold Star, post hole digger
Servis landscape rakes, box scrapers

Seymour Smith & Son, Inc., 900 Main St., Oakville, Conn. 06779
Garden tools, pruning shears, grass shears, hedge shears, lopping shears, tree pruners, pruning saws

Simplex Mfg. Co., 5224 N.E. 42nd Ave., Portland, Oregon 97218
Greenhouses

Simplicity Mfg. Co., 500 N. Spring St., Port Washington, Wisc. 53074
Lawn and garden tractors with wide range of hp tillers, turf rollers, mowers, rotary, reel, gang, sicklebar

Skil Corporation, 5033 Elston Ave., Chicago, Ill. 60630
Skilsaw, chain saws

R. & G. Sloane Mfg. Co., 7606 N. Clybourne Ave., Sun Valley, Calif. 91352
GSR Color Guard, PVC fittings for pipelines, sizes include ¾-inch through 2 inches class 315 and 2½ inches through 8 inches; class 200, press rated

Slope Tractor, Inc., 106 W. 9th Ave., Harper, Kansas 67058
Slope Runner, tractor mower, rotary flail or sickle, adjustable angle hydraulic lever control adjusts wheels and tractor chassis to remain in level attitude on a slope

Smith & Co., Inc., D.B., 414 Main St., Utica, N.Y. 13503
Sprayers, complete power unit

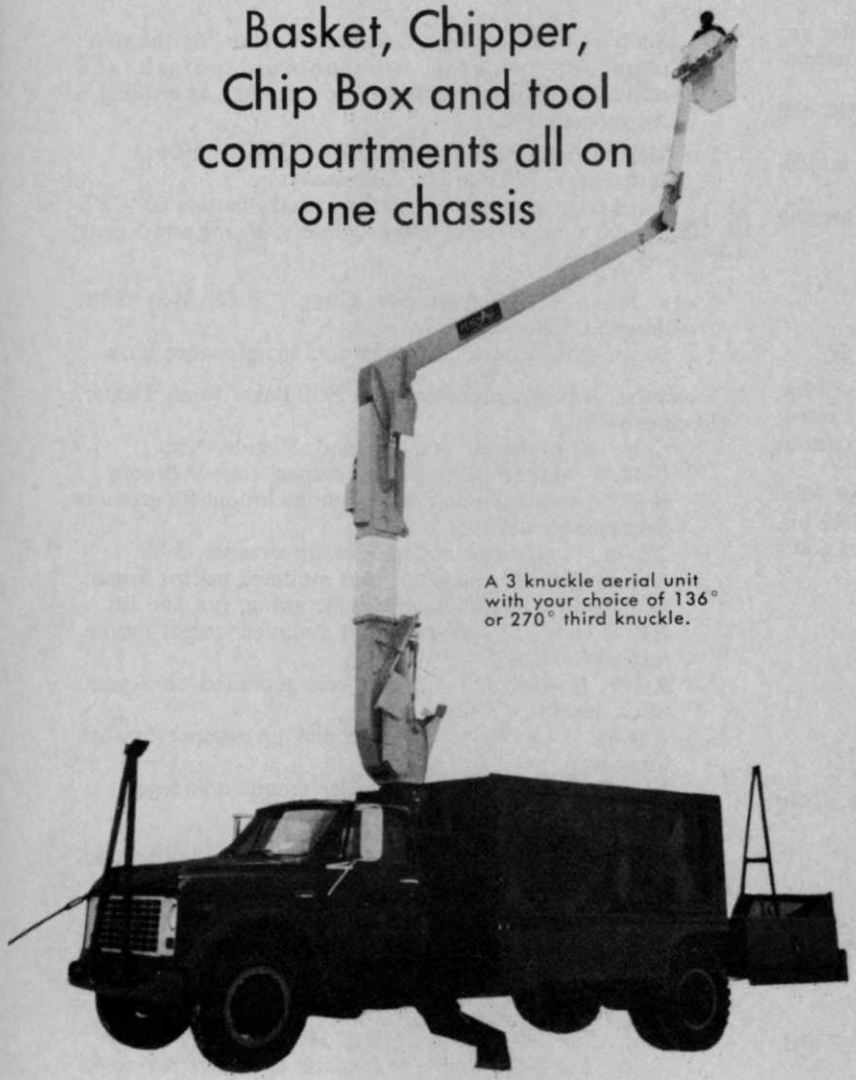
Smith Precision Products Co., 1299 Lawrence Dr., Newbury Park, Calif. 91320
Measure-Mix, measures precise mixture of fertilizer to water when watering shrubs, lawns, etc.

Smithco, Inc., 11 West Ave., Wayne, Pa. 19087
Red Rider, 3-wheel turf vehicle
Top Rider, top dresser
Little Beaver Spiker, spiker
Easy Rider III, sand trap rake
Lark, 110-gallon fiberglass sprayer
Hawk 200, 200-gallon fiberglass sprayer w/Golden Eagle pump
Hawk 300, 300-gallon fiberglass sprayer w/Golden Eagle pump
Cardinal, 200-gallon stainless steel sprayer w/Golden Eagle pump

The Snow Company, 4350 McKinley, Omaha, Nebraska 68112

REACH-ALL ©

A one-unit operation for tree service work. Basket, Chipper, Chip Box and tool compartments all on one chassis



A 3 knuckle aerial unit with your choice of 136° or 270° third knuckle.

Hydraulically operated chip boxes, either side or end ejection.

REACH-ALL Model 5050 3K aerial basket with hydraulically powered 12" chipper, a hydraulic ejection box and tool boxes. All assembled as one complete unit.

REACH-ALL increases your working area with its modern 3 knuckle design and includes fiberglass lower boom insert.

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REACH-ALL MANUFACTURING CO. DULUTH, MINN.

436 Calvary Road
Duluth, Minnesota

Phone 218-728-5138 for the name of the distributor in your area.

We will custom build to your special requirements

Snowco, utility trailer, Power-Kart, umbrella/buggy top, Nomad/Tri-Scat/Super-Scat

Soilmoisture Equipment Corp., 801 So. Kellogg Ave., Goleta, Calif. 93017
Jet Fill Tensiometer No. 2750, moisture measuring equipment for irrigation control, semi-permanent installation, sizes 6" through 60"
Quick Draw Tensiometer No. 2900, Moisture measuring equipment for irrigation control, portable, sizes 12" through 18"
Turf Probe No. 2950, double action tensiometer measuring moisture at 2" and 5", portable
Soilmoisture Gage No. 2700, moisturing measuring equipment for irrigation control, semi-permanent installation, sizes 6" through 60"
Soil Water Sampler No. 1900, Obtains soil water for laboratory analysis and leaching determinations, permanent installation, sizes 6", 11", 24", 36", and 48"
Soil Sampling System No. 215, "Veihmeyer/King" soil sampling probes, sizes 4' through 16'
Soil Auger No. 230, auger equipment for strata identification, core sizes of 2", 3", 3½", and 4"
Salinity Sensors & Bridge No. 5500, salinity sensing equipment for field use, portable

Solo Motors, Inc., P.O. Box 5030, 5100 Chestnut Ave., Newport News, Virginia 23605
Sprayer, Model 425 hand operated
Mistblower, Model 410 3 hp, Model 423 5 hp
Tractor Sprayer, 10 hp, Model 424 self-propelled; 18 hp, Model 450 self-propelled; Model 451 PTO mounted; Model 452 PTO mounted; 10 hp, Model 419 super custom mounted
Newport, blower Model 430 5 hp, mini Model 410 3 hp
Chain Saw, Model 610 3 SAE hp, Model 620 4 SAE hp, Model 650 6 SAE hp, Model 635 8 SAE hp, Model 660 7 SAE hp
Mower, sickle bar, 6.5 SAE hp, Model 520
Water Pump, 6.5 SAE hp, Model 801
Garden Tractor, Model 527 tiller 6.5 hp
Post Hole Digger, Model 812, 6.5 hp
Snow Blower, Model 813, 6.5 hp
Generator, Model 819, 110 volt
Engine, Model 272, 6.5 hp

Speedex Tractor Co., 367 N. Freedom St., Ravenna, Ohio 44266
Speedex, tractor, 8 hp, 10 hp, 14 hp
Mower, rotary, 36-inch, 44-inch, 50-inch

Spray Baby, Inc., 751 N. Edmonds Dr., Carson City, Nev. 89701
Seeders, hydraulic
Mulchers, hydraulic

Spraying Systems Co., North Avenue at Schmale Road, Wheaton, Illinois 60187
TeeJet, spray nozzles with interchangeable spray tips
Foam Jet, spray nozzles with interchangeable spray tips
Vee Jet, spray nozzles
GunJet, spray guns
FloodJet, spray nozzles

Sprinkler Irrigation Supply Co., Div. A. J. Miller, Inc., Campbell Rd., Royal Oak, Michigan 48067
Pipe, irrigation
Irrigation systems, complete
Sprinklers

Standard Mfg. Co., 220—E. 4th St., Cedar Falls, Iowa 50613
Standard, golf course equipment

Stihl American, Inc., 107 Bauer Dr., Oakland, N.J. 07436
Chain Saws, electric and gasoline powered, saw, chain, powered
Stihl SG-17, blower/sprayer, back-pack gasoline powered
Stihl Cutquik, saw, circular cut-off for cement, stone, steel, pipes, etc.
Stihl earth auger and planting tool, gasoline powered
Stihl Brush-Cutter, brush and weed cutter, gasoline powered
Stihl Hedge-Trimmer, hedge trimmer, gasoline powered, trim hedges and small brush/trees

Stone Construction Equipment, Inc., 32 Main, Honeoye, N.Y. 14471
Stone, digger—12 volt, operates off of 12 volt system; 2" to 7" digger dirt augers for digging post holes and holes for trees, shrubs, etc.

Sudbury Laboratory, Inc., 572 Dutton Rd., Sudbury, Mass. 01776
Sudbury Soil Test Kits, designed to make "on-the-spot" tests for nitrogen, phosphorus, potash and acidity/alkalinity; simple to use "as easy as reading a thermometer."

Sun-Mastr Corp., P.O. Box 31, Olathe, Kansas 66061
Safti-Shear, 74" and 90" flail mowers
Sun Mastr, mid-mount mowers; rotary cutters 60"-72"-84"; 60" and 72" rear-mount mowers; 3-gang and 5-gang reel mowers

Swan Hose Div.—Amerace Corp., P.O. Box 509, Worthington, Ohio 43085
Swan, garden hose, Industrial and maintenance hose

Sweepster, Jenkins Equipment Co., 2910 Baker Road, Dexter, Michigan 48130
C-36, self-propelled Walk Behind, 3' wide, 5 hp
C-48, 4' wide front mounted compact tractor broom
B-60, 5' wide front and rear mounted broom for grounds maintenance tractors
TR-48, 4' wide tow behind pick-up sweeper, 5 hp
AH, 6' wide 32" diameter front mounted tractor broom, all hydrualic operation, hydraulic swing, run and lift
HF, 6' wide 32" diameter front mounted tractor broom, mechanical drive
R-HF, 6' wide 32" diameter rear mounted on 3-point hitch, mechanical drive
HH-60, 5' wide loader mounted pick-up sweeper (for fork lifts also)
LH, 6' wide 32" diameter loader mounted sweeper
C-72, compact truck mounted broom

Swenson Spreader & Mfg. Co., P.O. Box 127, Lindenwood, Illinois 61049
Spreader, gas, hydraulic
Thatcher, attachment for rotary mowers
Leaf Loader, trailer mounted

T

TCI, Inc., Box 249, Benson, Minn. 56215
Tyler, 2 to 8-ton pull type fertilizer spreaders; 15' to 45' anhydrous ammonia applicators
Herculift, 4-wheel drive rough terrain forklifts
Super Challenger, 4-wheel drive, 1 yard bucket loader

Tallman Equipment Co., Inc., 3825 W. 31st St., Chicago, Illinois 60623
Shears

Tecumseh Products, 900 North St., Grafton, Wis. 53024
Tecumseh Engines, 2 to 18 hp, 4-cycle + 2-cycle, air and liquid cooled, single + twin cylinder
Tecumseh genuine parts
Peerless Gear Drives, transmission, transaxles, hydrostatic gear drives, right angle + T drives
Taylor Mufflers
SnowKing Engines

Teledyne Wisconsin Motor, 1910 South 53rd St., Milwaukee,

Wisconsin 53246
Wisconsin, Wisconsin-Robin, Wisconsin-Hatz Diesel, heavy-duty, air-cooled internal combustion engines, 3—80 hp, single, two, three and four-cylinder

Tennant Maintenance Systems, 781 North Lilac Dr., Minneapolis, Minn. 55490
Hydraulic heavy-duty power sweeper for driveways, walks and maintenance areas covered with cement

Terrain King Corp., 4444 Center, Houston, Texas 77007
Terrain King, rotary mowers—4'-25'
Turner, flail mowers—(3-point and boom)
Slopemower, boom type mowers—31' reach

Thomas Equipment, Ltd., Centreville, New Brunswick, Canada
Mower, Sickle, attachment to front end loader

Thompson Manufacturing, 2251 E. 7th St., Los Angeles 90023
Turf Irrigation Sprinkler and Accessories, gear driven rotary turf irrigation sprinklers

Tilton Equip. Co., 855 3rd St. S.W., New Brighton, Minnesota 55112
Jonsered Chain Saws, four models, 11 ½ to 20 lbs. weight, 12-60 inch bar length, automatic and dual system chain oiler

Tork Time Controls, Inc., 1 Grove St., Mt. Vernon, N.Y. 10550
Tork, irrigation, automatic lawn sprinkler controls

The Toro Company, 8111 Lyndale Ave., So. Bloomington, Minn. 55420
Hevi-Duty, mower, rotary (hand or self-propelled) 21 inch and 25 inch
Whirlwind, mower, rotary, 31-inch
Trojan, 60-inch cut
Professional, mower, triplex reel, 70-inch, 76-inch and 84-inch cut
Greenmaster, mower, walk greensmower, 21-inch
Greensmaster 3, mower, triplex greensmower, riding
Spartan Gang, mower, 5, 7 or 9 bladed-formal and semi-formal turf
Landscaper 4, multi-purpose landscaping tool for seedbed preparation, seeding, fertilizing, also Model 6 Pro.
Rake-O-Vac, turf and hard surface sweeper
EVCO Hydromulcher, equipment for the hydraulic establishment of vegetation
Parkmaster, 5-7-9 unit hydraulic mowing tractor
Roughmaster, 4 and 5 bladed rough area reel mowers
Toro Frames, reel mower transport and lift frames
Toro Turf Tractor, utility turf tractor
Sandpro, sand trap maintenance and grooming unit, all hydraulic
Groundsmaster 72 with 70 ½-inch cut, riding rotary mower
Workmaster, utility vehicle

Toro Irrigation Division, P.O. Box 489, Riverside, Calif. 92502
Automatic Controller, irrigation equipment, hydraulic or electric; 4, 8, 11, 23 station control satellite
Automatic Remote Control Valves, ¾-inch to 2-inch, hydraulic or electric
Pop Up Spray Sprinklers, 8-54 ft. diameter stream spray
Pop Up Rotary Sprinklers, 65-235 ft. diameter, valve and hand, hydraulic or electric, 2-speed, gear driven
Shrub and Bubbler Sprinklers, adjustable, stream, flood
Boring Machine, 10 ft. and 16 ft. models
Trenching Machines, residential, light commercial, converts to boring machine, 1-3 inches wide, 7 inches deep
Quick Coupling Valves, standard, vinyl or with lock cover, valve range ¾-inch to 1 ½ inches
Impact Sprinklers, ½-inch to 1 ¼ inches threaded connection, part of full circle

Towner Mfg. Co., P.O. Box 6096, Santa Ana, Calif. 92706
Trenchers and harrows

Tradewinds, Inc., P.O. Box 1191, Tacoma, Washington 98401
Holder, tractors, 4-wheel drive, diesel, 14 hp to 40 hp; tractor mounted sprayers, PTO pumps, complete with turbulator mistblowers, (all sizes from 22 gallons up); knapsack power sprayers (for mist, dust, granules, flamethrowers, etc.) world's only packsack sprayer with centrifugal pump

Travelrain Power Sprinkler Co., 239 No. Robertson Blvd., Beverly Hills, Calif. 90211
Travelrain Power Sprinkler, (irrigation) traveling sprinkler
Sharpomatic, drill & Tool sharpener (electric)

Tree ject Company, Box 396, Waycross, Ga. 31501
Sprayers, hose end, complete power unit

Triumph Machinery Co., Willow Grove St., Hackettstown, N.J. 07840
Rakes, landscape
Thatchers, mower, vertical
Mowers, sickle bar; rotary, heavy-duty

Trojan Battery Company, 9440 Ann St., Santa Fe Springs, Calif. 90670
Trojan, storage batteries—electric golf car, automotive, commercial, truck, bus, and industrial

Turf Service Laboratory, Inc., P.O. Box 1001, Laguna Beach, California 92651
Moistureometer Model 50, protable 12" probe electronic measures soil moisture from 1 inch to one foot
Moistureometer Model 20, portable 6-inch probe designed for measuring moisture in pots
Moistureometer Model 75, one meter probe designed to measure moisture at depths of one meter, 75 CM, 50 CM, and 25 CM permanent installation; meter separate digital read out

Turf Vac Corporation, P.O. Box 4339, Long Beach, Calif. 90804
Turf Vac, self-propelled rider vacuum
Fairway Master, sweepers—18-25 hp with hydraulic drive systems, blower attachments, and hand pick-up hose attachments, and hydraulic lift dump available; towed units 4 ½' to 10' wide, 10 ½-25 hp or PTO; hydraulic lift dump and hand intake hoses available

U

Universal Division Leigh Products, Inc., Coopersville, Michigan 49404
Universal-Spray Doc, sprayer—tank; sprayers—open top tank
Universal, slide sprayer; flame sprayers; hose-end sprayers; power sprayers; continuous and intermittent hand sprayers; hand dusters; fogger—mineral base

Universal Motor Division, Medalist Industries, P.O. Box 920, Oshkosh, Wisconsin 54901
Aquamaster Pumps, portable centrifugal pumps 1 ½" or 2" suc/disch., 3 hp gas engine or ½, ¾, 1 ½, 2 hp electric motors, standard seal for water, corrosion resistant seal for fertilizer, herbicides, etc.

Up-Right Scaffolds, 1013 Pardee St., Berkeley, Calif. 94710
Scaffolds, portable, aluminum for tree trimming

Utility Body Co., 901 Gilmen, Berkeley, Calif. 94710
Buckets—aerial towers

V

Val-Jac Mfg. & Supply Co., Inc., 110 N. Park, Maize, Kansas 67101

Small truck compactor for parks and recreational areas

Valley Products Corporation, Box 668, Valley, Nebr. 68064
VPC Stump Cutter, 8 hp one-man tree stump remover

Vandermolen Corp., 119 Dorsa Ave., Livingston, N.J. 07039
Blower KWH, for leaves and debris, wheeled, 2-cycle engine
KWH Mistblower, back pack
Diadem Brush Chipper, for branches up to 3", wheeled, PTO or skid models, 8 and 12 hp models
Bora KWH Mistblower, skid model, 110-gallon tank, 75-80 ft., reach fan power by rotary engine
Diadem Spreader/Seeder, broadcaster, PTO driven, 3-pt. hitch
Flykil, electric flykiller

Venable Sprinkler Sales, Inc., 3401 Couflans, Irving, Texas 75060
Pump-A-Matic, pre-built pump station for golf course, etc., irrigation
Pressure-Matic, booster pump unit to increase pressure of water in hydraulic system tubing to use potable water

Veri Products, P.O. Box 5129, Cardwell Station, Fresno, Calif. 93705
Scabbards for chain saws

Vermeer Manufacturing Company, P.O. Box 200, Pella, Iowa 50219
Stump Cutters, 12-65 hp, seven models
Tree Spades, 4 models (trailer or mounted)
Log Chippers, 2 models
Log Splitter,

Viking Pump Co., 4th and Shutte Sts., Cedar Falls, Iowa
Pumps

Village Blacksmith, McGraw Edison Portable Electric Tool Division, 1200 East State St., Geneva, Illinois 60134
Village Blacksmith, garden cutting tools, electric chain saws, electric hedge trimmers, electric edger trimmers, electric cultivator, Cord Reels, "Blitz Fog" insect fogging devices, gas engine fogger, electric tree surgeon, post hole diggers and augers

Vogel Tool & Die Corp., Stone Park, Illinois
Post hole drill

W

W-W Grinder, 2957 N. Market, Suite 169, Wichita, Kansas 67219
Shredder-Grinders, complete line of soil shredder-grinders for gardeners, nurseries, greenhouses, etc.; horsepowers ranging from 1 hp models to 30 hp models; available with gas engines, electric motors or less power; some models feature electric start gas engines

Waco Industries, Inc., 749 Airways Blvd., Jackson, Tenn. 38301
Chain saws

Waldon, Inc., 201 W. Oklahoma Ave., Fairview, Okla. 73737
Tractor, hydraulic, 4-wheel drive, articulating and oscillating type frame plus utility air, may be used as a forklift or loader
Pickup Broom, attachment to Waldon 5000 tractor
Snow Blower, attachment, auxil. engine, 65 hp, chain drive
Forklift, boom type, attachment to Waldon 5000 tractor
Scrap Grab, attachment, lift capacity 1300 to 1900 lbs.
Backhoe, attachment to Waldon 5000 tractor

Walsh Manufacturing Co., 1200 Fisher Street, Charles City, Iowa 50616
Trailer Model Sprayer, exclusive sump trap, exclusive uni-stand, rear safety stand 200, 300, and 500-gallon cap.; built in nylon agitator
RA Side Mounted Sprayer, 400-gallon capacity; each tank valve controlled, 2-200 gallon tanks, custom fit mounting brackets, valve stand
3-Point Hitch Sprayer, 165, 200, or 300-gallon capacity, Cat. II hitch pins
Fiberglass Tanks (all above units), 10" x 20" fill hole; bullet shaped ends; built in agitators built in steel outlets; 1¼" steel sump outlet; double protection inner lining; lid with snap-over lock; special sump trap and anti-swirl baffle; continuous flow pump; sprays evenly over all terrain; sprays to last drop
Index-O-Matic Washer, completely portable; semi-pneumatic tires; all-steel frame 5 or 25-gallon tank; 3 GPM pump; 1½ hp motor; fiberglass tank
Tri-Matic II, fiberglass tank; completely portable; all-steel frame 25-gallon tank; 3 GPM pump; 1½" hp motor; semi-pneumatic tires

Waymark, 44 River St., Cortland, N.Y. 13045
Spreaders, disc type
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Pup, pickup refuse packer

Weather-matic Division/Telsco Industries, P.O. Box 18205, Dallas, Texas 75218
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H. N. Webster Mfg., P.O. Box 623, Sebring, Florida 33870
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Wet Mfg. Co., Inc., 955 Elm St., Orange, Calif. 92667
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Wheel Horse D-180 Automatic, 18 hp twin cylinder tractor: featuring—automatic transmission with "no belt" drive; sealed beam head and taillights; hydraulic lift; 5¾-

gallon fuel tank; cluster dials; two piece adjustable seat; front PTO; optional splined rear PTO; optional category "O" three point hitch; optional disc turning brakes; 3-way safety interlock system; and a choice of four tire options

Wheel Horse D-160 Automatic, 16 hp tractor; featuring—automatic transmission with "no belt" drive; front PTO; polyfoam seat; hydraulic lift; 5¾-gallon fuel tank; ammeter; many options; 3-way safety interlock system; and a choice of four tire options

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Wheel Horse C-160 8-speed, 16 hp tractor; featuring—heavy-duty all gear 8-speed transmission; two piece adjustable seat; ammeter; 2-gallon fuel tank; unitized steel frame; head and taillights; friction disc attachment clutch; soft feel steering wheel; turf saver tires; optional electric lift; and a 3-way safety interlock system

Wheel Horse C-120 Automatic, 12 hp tractor; featuring—automatic transmission (hydrostatic-oil drive); two-piece adjustable seat; spring seat suspension; ammeter; 2-gallon fuel tank; unitized steel frame; head and taillights; friction disc attachment clutch; soft feel steering wheel; turf saver tires; optional hydraulic lift; and a 3-way safety interlock system

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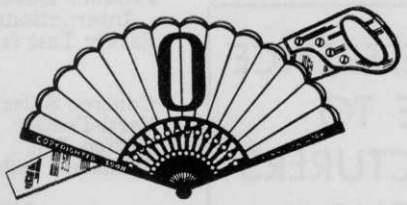

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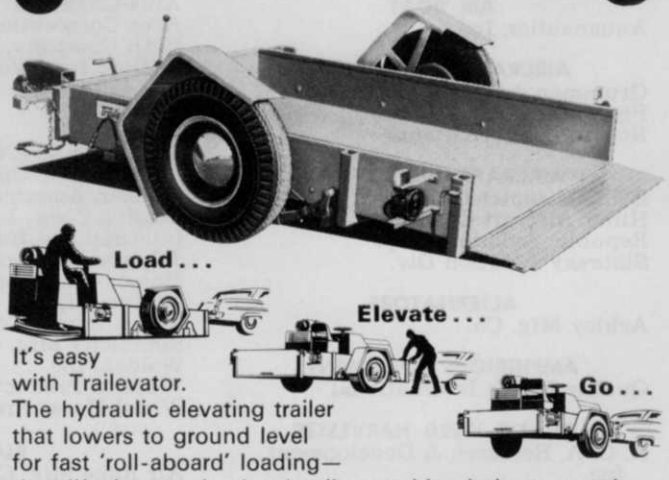

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Weather-matic Div., Telsco Ind.
Wet Mfg. Co., Inc.

IRRIGATION SPRINKLERS, ROTARY, POP-UP, HEADS
Aqua-Dial
Buckner/Johns Manville
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
L. R. Nelson Corporation
RainBird Sprinkler Mfg. Corp.
Rain Jet Corporation
Rain-O-Mat Sprinklers, Inc.
Safe-T-Lawn, Inc.
Sprinkler Irrigation Supply Co.
Thompson Manufacturing
Toro Irrigation Division
Weather-matic Div., Telsco Ind.

IRRIGATION SPRINKLERS, STATIONARY
Aqua-Dial
Buckner/Johns Manville
Champion Brass Mfg.
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
RainBird Sprinkler Mfg. Corp.
Rain Jet Corporation
Rain-O-Mat Sprinklers, Inc.
Sprinkler Irrigation Supply Co.
Toro Irrigation Division
Weather-matic Div., Telsco Ind.

IRRIGATION SPRINKLERS, VALVE IN HEAD
Buckner/Johns Manville
RainBird Sprinkler Mfg. Corp.

IRRIGATION SYSTEMS, COMPLETE
Buckner/Johns Manville
Greenlawn Sprinkler Co.
Moody Sprinkler Co., Inc.
L. R. Nelson Mfg. Co., Inc.
RainBird Sprinkler Mfg. Corp.

Rain Jet Corporation
Sprinkler Irrigation Supply Co., Div. A. J. Miller Inc.
Toro Irrigation Division
Weather-matic Div., Telsco Ind.
Wet Mfg. Co., Inc.

IRRIGATION, SWITCHES
Buckner/Johns Manville
L. R. Nelson Mfg. Co., Inc.
RainBird Sprinkler Mfg. Corp.

IRRIGATION, SAND SEPARATORS
Moody Sprinkler Co., Inc.
Perma-Rain Irrigation, Inc.
Rain-O-Mat Sprinklers, Inc.

IRRIGATION, MISCELLANEOUS ACCESSORIES
Buckner/Johns Manville
Certain-teed Pipe & Plastics Group
Champion Brass Mfg.
Cresline Plastic Pipe Co., Inc.
Greenlawn Sprinkler Co.
King Bros. Industries
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
L. R. Nelson Mfg. Co., Inc.
RainBird Sprinkler Mfg. Corp.
Rain Jet Corporation
Rain-O-Mat Sprinklers, Inc.
Safe-T-Lawn, Inc.
Thompson Manufacturing
Toro Irrigation Division
Weather-matic Div., Telsco Ind.

IRRIGATION VALVES, AUTOMATIC
Aqua-Dial
Buckner/Johns Manville
Champion Brass Mfg.
Greenlawn Sprinkler Co.
W. L. Hamilton Co.
Hays Mfg. Div., Zurn Industries
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
L. R. Nelson Mfg. Co., Inc.
RainBird Sprinkler Mfg. Corp.
Rain-O-Mat Sprinklers, Inc.
Toro Irrigation Division
Weather-matic Div., Telsco Ind.

IRRIGATION VALVES, FLOW CONTROL
Griswold Controls
Moody Sprinkler Co., Inc.
Toro Irrigation Division

IRRIGATION VALVES, MANUAL
Greenlawn Sprinkler Co.

IRRIGATION VALVES, PRESSURE ACTIVATED
Griswold Controls
W. L. Hamilton Co.
Moody Sprinkler Co., Inc.
RainBird Sprinkler Mfg. Corp.
Toro Irrigation Division

IRRIGATION, QUICK COUPLING VALVES
Buckner/Johns Manville
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
L. R. Nelson Mfg. Co., Inc.
RainBird Sprinkler Mfg. Corp.
Rain-O-Mat Sprinklers, Inc.
Sprinkler Irrigation Supply Co.
Toro Irrigation Division
Weather-matic Div., Telsco Ind.
H. N. Webster Mfg.

IRRIGATION VALVES, SOLENOID
Griswold Controls
Hays Mfg. Div., Zurn Industries, Inc.
Melnor, Turf Irrigation Div.
Moody Sprinkler Co., Inc.
RainBird Sprinkler Mfg. Corp.
Toro Irrigation Division

KNIVES, INJECTOR
Contree Sales, Inc.

LANDSCAPING, STUDY COURSES
Lifetime Career Schools

LEAF BLOWERS
Billy Goat Industries, Inc.
Finn Equipment Co.
Gravely Corp.
Lindell Pattern Works
F. E. Myers & Bro. Co.
Papec Machine Co.
Parker Sweeper Co.
Solo Motors, Inc.
The Vandermolen Co.

LEVELERS
(Also See Blades, Dozer Scraper)
Arps Corporation
Brillion Iron Works, Inc.
Deere & Co.
DriAll Drier's Inc.
Eversman Mfg. Co.
International Harvester Co.
Servis Equipment Co.
Side-Winder Plant, FMC Corp.

LITTER RECEPTACLES
Bemis Mfg. Co.
Friend Mfg. Corp.

LOADERS, BOOM
Century Engineering Corp.
Deere & Co.
Dico Co., Inc.
Howard Rotavator Co., Inc.
Pitman Mfg. Co.
Waldon, Inc.

LOADER, SKID STEER
Clark Equipment Co.
Davis Mfg.
Deere and Co.
Erickson Corp.
International Harvester Co.
K-D Manufacturing Co.
Massey Ferguson Inc. (Industrial Products)
Melroe Division
TCI, Inc.

LOADERS, TRACTOR MOUNTED
Allis-Chalmers
Arps Corp.
Deere & Co.
Engineering Products Co.
Ford Motor Co., Tractor Div.
Giant-Vac Mfg. Inc.
Gravely Corp.
International Harvester Co.
Johnson Hydraulic Equip. Co.
Massey-Ferguson, Inc.
Melroe Mfg. Co.
The Sun-Mastr Corp.
Vermeer Manufacturing Co.

LOG SPLITTERS
Lupton Tree Service
Piqua Engineering, Inc.
Vermeer Mfg. Co.

MARKERS, LINE
Fox Valley Marking Systems

MASKS, DUST
Acme Protection Equipment Corp.
American Optical Co.
Martindale Electric Co.
Mine Safety Appliances Co.
Welsh Mfg. Co.
Willson Products Div., Ray-O-Vac

MASKS, GAS
Acme Protection Equipment Corp.
Mine Safety Appliances Co.
Safeline Products
Welsh Mfg. Co.
Willson Products Div., Ray-O-Vac

MATERIALS, HANDLING
B.A.G. Corp.
Bemis Mfg. Co.

MEASURING WHEEL
Gandy Co.

MASKS, FACE
American Optical Corp.

MISTBLOWERS, BACKPACK
Buffalo Turbine Ag. Equip. Co.
Curtis Dyna Products Corporation
Echo Chain Saw Div., Kioritz Corp. of America
Friends Mfg. Corp.
H. D. Hudson Mfg. Co.
Robco, Inc.
Solo Motors, Inc.
Stihl American, Inc.
Tradewinds, Inc.
Vandermolen Corp.

MISTBLOWERS, ELECTRIC
Root-Lowell Corp.

MISTBLOWERS, SELF-PROPELLED
Century Engineering Corp.
Solo Motors, Inc.
Tradewinds, Inc.

MISTBLOWERS, TRUCK-MOUNTED
Ag. Machinery Div., FMC Corp.
Aquanautics, Inc.
The Broyhill Co.
Buffalo Turbine Ag. Equip. Co.
Finn Equipment Co.
F. E. Myers & Bro. Co.
Solo Motors, Inc.
Vandermolen Corp.

MISTBLOWERS, NOZZLE PARTS
Ag. Machinery Div., FMC Corporation
The Broyhill Co.
Buffalo Turbine Equipment Co.
Century Engineering Corp.
Delevan Mfg. Co.
H. D. Hudson Mfg. Co.
F. E. Myers & Bro. Co.
Solo Motors, Inc.
Spraying Systems Co.

MOISTURE METERS
Agtronics Mfg. Co.
Irrometer Company
JLM Products & Design
Soilmoisture Equipment Corp.
Turf Service Laboratory, Inc.

MOWERS, FLAIL
BMB Company
Brillion Iron Works, Inc.
E. L. Caldwell & Sons, Inc.
Deere and Co.
Excel Industries, Inc.
FMC Side-Winder
Ford Motor Co., Tractor Div.
Gravely Corp.
International Harvester Co.
Kinco Mfg.
Lakes Supply Co., Inc.
Massey-Ferguson, Inc.
Mathews Company
Mott Corporation
Slope Tractor, Inc.
Sun-Master, Corp.
Terrain King Corp.

MOWERS, GREENS
Cooper Mfg. Co.
Hahn, Inc.
Jacobsen Mfg. Co.
National Mower Co.
The Toro Company

MOWERS, REEL
Bunton Company
Cooper Mfg. Co.
Engineering Products Co.
Hahn, Inc.
Jacobsen Mfg. Co.
Jari Corp.

Locke Mfg., Div. Stellar Lawn Care
McDonough Power Equipment, Inc.
National Mower Co.
Roseman Mower Corporation
Roxy-Bonner, Inc.
Simplicity Mfg. Co.
The Sun-Mastr Corp.
The Toro Company

MOWERS, ROTARY

AMF Western Tool Division
Allis-Chalmers
Ariens Company
Avco Ezee Flow Div.
BMB Company
The Black & Decker Mfg. Co.
Brillion Iron Works, Inc.
Bunton Co.
E. L. Caldwell & Sons, Inc.
Deere & Co.
Economy Tractor
Engineering Products Co.
Excel Industries, Inc.
Flymo Division, Keltec, Inc.
Ford Motor Co., Tractor Div.
Goodall Div.
Hesston Corporation, Ind. Div.
Hydro Turf
International Harvester Co.
Jacobsen Mfg. Co.
Jari Corp.
Lawn-Boy, OMC-Lincoln
Lehara Equipment Co., Inc.
Locke Mfg. Div. Stellar Lawn Care
MTD Products, Inc.
Massey-Ferguson, Inc.
McDonough Power Equipment, Inc.
Outdoor Power Equip. Div., FMC Corp.
Roof Mfg.
Ryan, OMC-Lincoln
M. J. Scott Co.
Servis Equipment Co.
Side-Winder, FMC Corp.
Simplicity Mfg. Co.
Slope Tractor, Inc.
Solo Motors, Inc.
Speedex Tractor Co.
The Sun-Master Corp.
Terrain King Corp.
The Toro Company
Triumph Machinery Co.
Wheel-Horse Products
Wood Brothers, Inc.
Yazoo Mfg. Co.

MOWERS, SICKLE BAR

Allis-Chalmers
BMB Co., Inc.
Deere & Co.
Ford Tractor Operations, North America
International Harvester Co.
Jacobsen Mfg. Co.
Kinco Mfg.
Massey-Ferguson, Inc.
Simplicity Mfg. Co.
Slope Tractor, Inc.
Solo Motors, Inc.
Thomas Equipment Ltd.
Triumph Machinery Co.
Wheel Horse Products
Year-A-Round Cab Corp. (Jari Div.)

MOWERS, VERTICAL
(Also See Thatcher)

Artic Mizer Manufacturers, Inc.
Deere & Co.
E-Z Rake, Inc.
Giant-Vac Mfg., Inc.
Hahn, Inc.
International Harvester Co.
Jacobsen Mfg. Co.
F. D. Kees Mfg. Co.
Kinco Mfg.
Parker Sweeper Co.
Rental Equipment Mfg. Co.
Ryan, OMC-Lincoln
Terrain King Corp.
Triumph Machinery Co.

MOWERS, REPLACEMENT PARTS

Allis-Chalmers
Ariens Company
Deere & Co.
Flymo Div., Keltec Inc.
Ford Motor Co., Tractor Div.
Goodall Div.
Hesston Corp.
International Harvester
Jacobsen Mfg. Co.
Lakeshore Equipment & Supply Co.
Locke Mfg. Co., Inc.
Massey-Ferguson
Roof Manufacturing Co.
Ryan, OMC-Lincoln
Servis Equipment Co.
Side-Winder, FMC Corp.
Slope Tractor, Inc.
The Sun-Master Corp.
Terrain King Corp.
The Toro Company
Wheel Horse Products
Wood Brothers, Inc.
Yazoo Mfg. Co., Inc.
Year-A-Round Cab Corp. (Jari Div.)

MULCH BLOWERS

Bowie Industries, Inc.
Finn Equipment Co.
Reinco

NOZZLES
(See Spray Nozzles)

OIL STORAGE

Contree Sales, Inc.

PAINT, MARKING

Fox Valley Marking Systems

PARK EQUIPMENT

Game Time, Inc.

PIPE
(See Irrigation Pipe)

Amoco Chemicals Corp.
Cresline Plastic Pipe Co., Inc.
Hydro-Turf

PIPE FITTINGS

R & G Sloane Mfg. Co.

PLAYGROUND EQUIPMENT

Game Time, Inc.

PLOWS, VIBRATORY

Charles Machine Works, Inc.
Jacobsen Manufacturing Co.
Vermeer Mfg. Co.

POST HOLE DIGGER

Hoffco, Inc.
Fred A. Lewis Company
Servis Equipment Company
Solo Motors, Inc.
Stone Construction Equipment, Inc.
Village Blacksmith
Vogel Tool & Die Corp.

PROPORTIONING SYSTEMS

Contree Sales, Inc.
Vineland Laboratories, Inc.

PROTECTIVE CLOTHING

American Optical Co.
Friend Mfg. Corp.
Mine Safety Appliances Co.

PRUNERS

Ackley Mfg. Co.
Asplundh Chipper Co.
Bartlett Mfg. Co.
Corona Clipper Co.
Fairmont Hydraulics
Fanno Saw Works
Friend Mfg. Co.
Jameson Corporation
Karl Kuemmerling, Inc.
Limb-Lopper Co., Inc.
Pitman Mfg. Co.
H. K. Porter, Inc.
Rowco Mfg. Co., Inc.
Safety Test & Equipment Co.
Seymour Smith & Son, Inc.
Stihl American, Inc.
Village Blacksmith

PUMPS
(Also See Sprayers, Complete Power Unit)

Ace Pump Corp.
Ag. Machinery Div., FMC Corp.
Aurora Pump
Berkley Pump Company
John Blue Co.
Bowie Industries, Inc.
The Broyhill Co.
Century Engineering Corp.
Contree Sales, Inc.
Delavan Manufacturing Corp.
Friend Manufacturing Corp.
H. D. Hudson Mfg. Co.
Hydraulic Products Co., Inc.
Hydro Turf
Hypro, Inc.
Larson Machine, Inc.
F. E. Myers & Bro. Co.
Oberdorfer Pump Div.
Robco, Inc.
Root-Lowell Corp.
Solo Motors, Inc.
Universal Motor Co.
Venable Sprinkler Sales, Inc.
Viking Pump Company

PUMPS, CENTRIFUGAL

Ace Pump Corp.
Aurora Pump
Berkley Pump Company
L. L. Larson Machine, Inc.
Oberdorfer Foundries Inc., Agri. Pump Div.
Universal Motor Div., Medalist Ind.

PUMPS, DIAPHRAGM

Ace Pump Corp.

PUMPS, PISTON

L. L. Larson Machine, Inc.
Robco, Inc.

PUMPS, ROLLER

L. L. Larson Machine, Inc.

PUMPS, SUBMERSIBLE

Ackley Mfg. Co.
Hydraulic Products Co., Inc.
ITT Marlow

PUMPS, TURBINE

Hydraulic Products Co., Inc.

RAKES, LANDSCAPING

Arps Corporation
Brillion Iron Works, Inc.
Deere & Co.
Ford Motor Co.
International Harvester
Roseman Mower Corporation
Servis Equipment Company
Triumph Machinery Co.
York Modern Corp.

RAKES, ALL PURPOSE

Arps Corp.
Asplundh Chipper Co.
Bartlett Mfg. Co.
Brillion Iron Works, Inc.
Coursigns, Inc.
Deere & Co.
Ford Motor Co., Tractor Div.
International Harvester Co.
Jari Corp.
F. D. Kees Mfg. Co.
Lely Corp.
Rental Equipment Mfg. Co.
Roseman Mower Co.
Ryan, OMC-Lincoln
Servis Equip. Co.
Skaggs Turf Equipment Co.

Smithco, Inc.
The Toro Company
York Rakes

REELS, HOSE
Ag. Machinery Div., FMC Corp.
American Hose & Reel Co.
Friend Mfg. Corp.
Clifford B. Hannay & Son, Inc.
H. D. Hudson Mfg. Co.
F. E. Myers & Bros. Co.

RESPIRATORS
Acme Protection Equipment Corp.
American Optical Co.
Friend Mfg. Co.
Glendale Optical Co., Inc.
Martindale Electric Co.
Mine Safety Appliances Co.
Safeline Products
The Vandermolen Co.
Welsh Mfg. Co.
Willson Products Div., Ray-O-Vac

ROCK PICKERS
(Also See Stone Pickers)
Armor Metal Products
William Bergman Company
Bridgeport Implement Works, Inc.

ROLLERS, TURF
Brillion Iron Works, Inc.
Ford Motor Co., Tractor Div.
Hadfield Sod Roller Co.
International Harvester Co.
Lakes Supply Co., Inc.
Maxey Manufacturing Co., Inc.
Rosco Manufacturing Co.
Ryan, OMC-Lincoln
Simplicity Mfg. Co.
Wheel-Horse Products

ROOT-FEEDING RODS
Ross Daniels, Inc.
H. D. Hudson Mfg. Co.
Hydroponic Chemical Co., Inc.

ROOT PRUNERS
Schutt's Equipment Co.

SAFETY BELTS AND SADDLES, TREE CLIMBERS
American Arborist Supplies
Asplundh Chipper Co.
Bartlett Mfg. Co.
Karl Kuemmerling, Inc.
Mine Safety Appliances Co.

SAFETY EQUIPMENT
Ag. Machinery Div., FMC Corporation
American Optical Co.
Asplundh Chipper Co.
Bartlett Mfg. Co.
Friend Mfg. Corp.
General Scientific Equipment Co.
Glendale Optical Co.
Karl Kuemmerling, Inc.
Martindale Electric Co.
Mine Safety Appliances Co.
Product Development International
Safeline Products
The Vandermolen Co.
Welsh Mfg. Co.
Wilson Products Div., Ray-O-Vac

SAWS, MANUAL
Bartlett Mfg. Co.
The Fanno Saw Works
Friend Mfg. Corp.
Karl Kuemmerling, Inc.
Seymour Smith & Son, Inc.

SAWS, CHAIN, ELECTRIC
Beaird-Poulan Div., Emerson Electric Co.
Campbell-Hausfeld Co.
DESA Industries, Inc.
Stihl American, Inc.
Village Blacksmith

SAWS, CHAIN, GASOLINE
Allis-Chalmers Corp., Outdoor and Leisure Products
Beaird-Poulan Div., Emerson Electric Co.
Campbell-Hausfeld Co.
Deere & Co.
DESA Industries, Inc.
Echo Chain Saw Div., Kioritz Corp. of America
Ford Tractor Operations, North America
Friend Mfg. Corp.
Hoffco, Inc.
Homelite
Husqvarna, Inc.
Jobu Chain Saws
Landcaster Pump & Mfg. Co., Inc.
Lombard Power Equipment
McCulloch Corp.
Omark Industries, Inc., Oregon Saw Chain Div.
Partner Industries of America
Pioneer, OMC-Lincoln
Quadra Mfg. Ltd.
Roper Corporation
Skil Corporation
Solo Motors, Inc.
Stihl American, Inc.
Tilton Equipment Co.
Waco Industries, Inc.

SAWS, CHAIN, HYDRAULIC
Ackley Mfg. Co.
Fairmont Hydraulics
Limb Lopper Co., Inc.

SAWS, CHAIN, PNEUMATIC
DESA Industries, Inc.
Limb-Lopper Co., Inc.

SAWS, CIRCULAR, GASOLINE
Skil Corporation
Stihl American, Inc.

SAWS, CIRCULAR, HYDRAULIC
Ackley Mfg. Co.
Fairmont Hydraulics
Limb Lopper Co., Inc.

SAWS, CIRCULAR, PNEUMATIC
Ackley Mfg. Co.
Limb Lopper Co., Inc.

SAWS, CIRCULAR, ELECTRIC
Allis-Chalmers Corp. Outdoor and Leisure Products
The Black & Decker Mfg. Co.
Friend Mfg. Corp.
Skil Corporation

SAWS, CHAIN, PARTS
Beaird-Poulan Div., Emerson Electric Co.
Campbell-Hausfeld Co.
Grandberg Industries
McCulloch Corporation
Omark Industries, Inc., Oregon Saw Chain Div.
Pioneer, OMC-Lincoln
Sabre Saw Chain
Skil Corporation
Stihl American, Inc.

SAWS, EARTH
Charles Machines Works, Inc.

SCAFFOLDS
Up-Right Scaffolds

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Bartlett Mfg. Company
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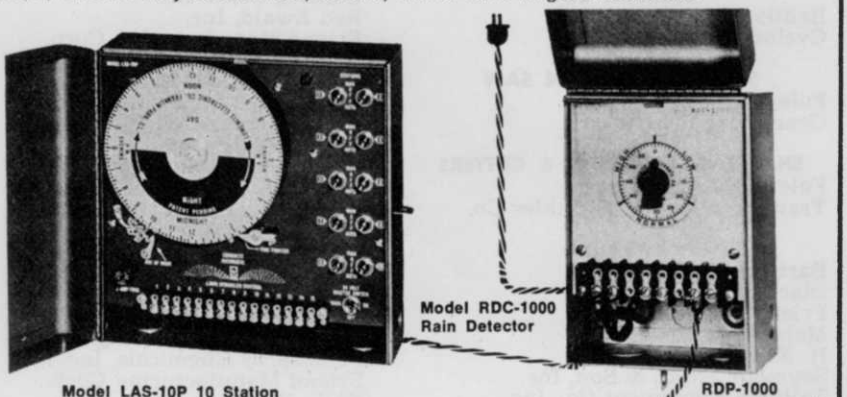

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SCYTHES
Echo Chain Saw Div., Kioritz Corp. of America
Hoffco, Inc.

SEEDERS, BELT TYPE
Ag. Machinery Div., FMC Corporation

SEEDERS, DISC-TYPE
Brillion Iron Works, Inc.
International Harvester Co.
The Toro Company
Vandermolen Export Co.

SEEDERS, HOPPER-TYPE
Avco Ezee Flow Div.
Brillion Iron Works, Inc.
Cyclone Seeder Co., Inc.
Deere & Co.
Engineering Product Co.
Gandy Co.
Garber Seeders, Inc.
Herd Seeder Co., Inc.
Hydro-Turf
International Harvester Co.
Jacobsen Mfg. Co.
L. L. Larson Machine, Inc.
Lawn Medic, Inc.
Lely Corporation
Parker Sweeper Co.
Vandermolen Corp.

SEEDERS, HYDRAULIC
Bowie Industries
Finn Equipment Company
Hydro Turf
Reinco, Inc.
Spray Baby
The Toro Company

SEEDERS, SOD
Brillion Iron Works, Inc.
Cyclone Seeder Co., Inc.

SHARPENER, CHAIN SAW
Foley Mfg. Co.
Grandberg Industries

SHARPENER, MOWERS & CUTTERS
Foley Mfg. Co.
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SHEARS
Bartlett Mfg. Co.
Black & Decker
Friend Mfg. Co.
Melnor Industries, Inc.
H. K. Porter, Inc.
Seymour Smith & Son, Inc.
Tallman Equipment Co., Inc.

SHREDDERS
(Also See Chippers)
Deere & Co.
Engineering Products Co.
Ford Motor Co., Tractor Div.
F. D. Kees Mfg. Co.
Kemp Shredder Co.
Lindig Mfg. Co.
MTD Products, Inc.
Outdoor Power Equipment Div., FMC Corp.
Roto-Hoe Co.
Royer Foundry & Machine Co.
W-W Grinder

SNOW THROWER
Allis-Chalmers Corp., Outdoor and Leisure Products
Deere & Co.
International Harvester Co., Consumer Products
Jacobsen Mfg. Co.
Massey-Ferguson, Inc.
Outdoor Power Equipment Div., FMC Corp.
Solo Motors, Inc.
The Toro Company
Waldon, Inc.
Wheel-Horse Products
Yardman, The Leisure Group, Inc.

SOD CUTTERS
Beck Mfg. Co.
Big Brute Turf Cut
Bowie Industries, Inc.
Brouwer Turf Equipment, Ltd.
Jacobsen Mfg. Co.
Princeton Manufacturing Co.
Ryan, OMC-Lincoln

SOD HARVESTERS
Beck Manufacturing Company
Big J. Products, Inc.
Brouwer Turf Equipment Ltd.
Nunes Manufacturing
Princeton Manufacturing Co.

SOIL TESTERS
Contree Sales, Inc.
Hydroponic Chemical Co., Inc.
Sudbury Laboratory, Inc.

SPADE, TREE
(Also See Tree Movers)
CareTree Systems
Vermeer Mfg. Co.

SPIKERS
Hahn, Inc.
Jacobsen Mfg. Co.
Power Spike Mfg. Co.
Ryan, OMC-Lincoln
Smithco, Inc.

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Ag. Machinery Div., FMC Corp.
AmChem Products, Inc.
The Broyhill Co.
Century Engineering Corp.
Contree Sales, Inc.
Red Ewald, Inc.
Friend Manufacturing Corp.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
F. E. Myers & Bro. Co.
Papec Machine Co.
Root-Lowell Corp.
Walsh Manufacturing Co.

SPRAY GUNS
Ag. Machinery Div., FMC Corp.
Bar-Way Mfg. Co.
The Broyhill Co.
Century Engineering Corp.
Contree Sales, Inc.
Delavan Manufacturing Co.
Foamspray Chemicals, Inc.
Friend Manufacturing Corp.
W. L. Hamilton Co.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
Melnor Industries, Inc.
F. E. Myers & Bro. Co.
Foot-Lowell Corp.
Spraying Systems Co.
Walsh Manufacturing Co.

SPRAY NOZZLES, COMPLETE
Amchem Products, Inc.
Bete Fog Nozzle, Inc.
The Broyhill Co.
Buffalo Turbine Equipment Co.
Century Engineering Corp.
Contree Sales, Inc.
Delavan Manufacturing Co.
Foamspray Chemicals, Inc.
Friend Manufacturing Corp.
W. L. Hamilton Co.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
Melnor Industries
F. E. Myers & Bro. Co.
Papec Machine Co.
Root-Lowell Corp.
Spraying Systems Co.
Walsh Mfg. Co.

SPRAY NOZZLES, DISKS
The Broyhill Co.
Century Engineering Corp.
Delavan Manufacturing Co.
Friend Manufacturing Corp.
L. L. Larson Machine, Inc.
F. E. Myers & Bro. Co.
Spraying Systems Co.
Vandermolen Co.
Walsh Manufacturing Co.

SPRAY NOZZLES, WHIRLS
The Broyhill Co.
Century Engineering Corp.
Delavan Mfg. Co.
Friend Manufacturing Corp.
L. L. Larson Machine, Inc.
F. E. Myers & Bro. Co.
Spraying Systems Co.
Walsh Manufacturing Co.

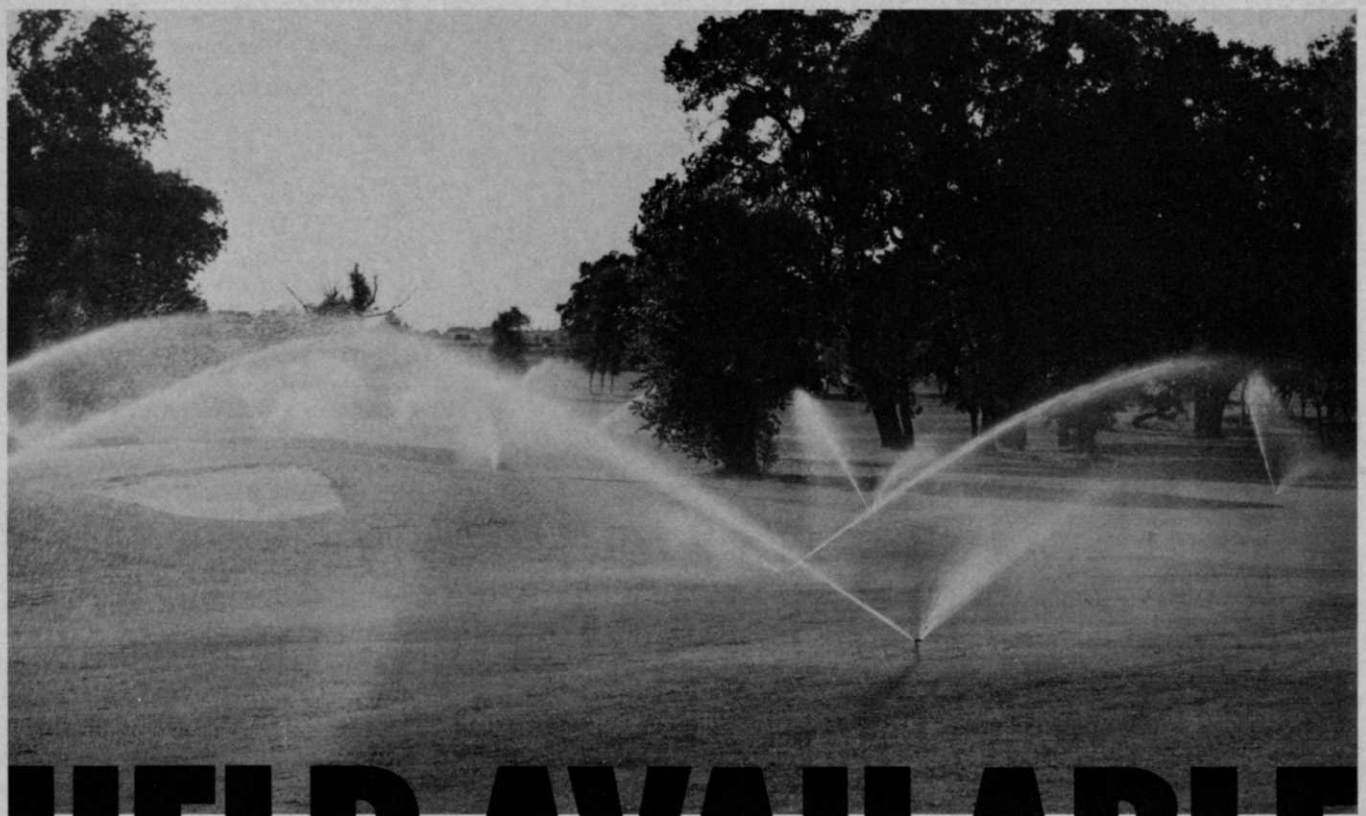
SPRAY-SLEEVE
Becco Products Co.

SPRAYER, BIFLUID
Ag. Machinery Div., FMC Corporation
The Broyhill Co.
Buffalo Turbine Equipment Co.
Red Ewald, Inc.
Finn Equipment Co.
Friend Mfg. Corp.

SPRAYERS, BOOM
Ag. Machinery Div., FMC Corp.
Amchem Products, Inc.
John Blue Co., Inc.
The Broyhill Co.
Century Engineering Corp.
Contree Sales
Cushman, OMC-Lincoln
Deere & Co.
Red Ewald, Inc.
Fimco, Inc.
Friend Manufacturing Corp.
Hahn, Inc.
H. D. Hudson Mfg. Co.
International Harvester Co.
L. L. Larson Machine, Inc.
F. E. Myers & Bro. Co.
Papec Machine Co.
Root-Lowell Corp.
Walsh Manufacturing Co.
Waymark

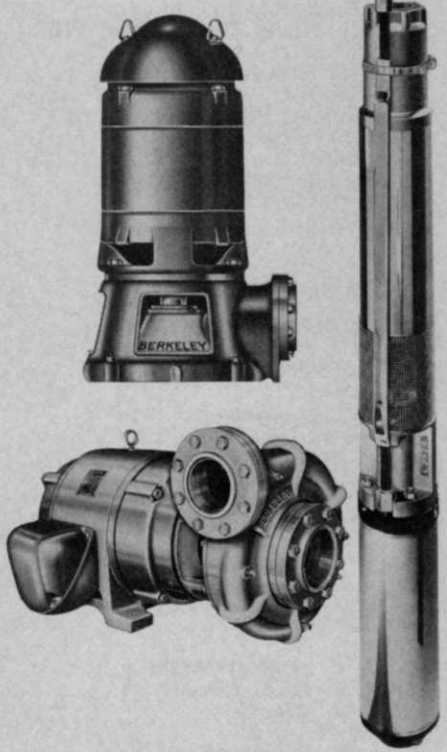
SPRAYERS, CART OR WHEELBARROW TYPE
Ag. Machinery Div., FMC Corp.
Amchem Products, Inc.
The Broyhill Co.
Buffalo Turbine Ind. Equipment Co.
Century Engineering Corp.
Deere & Co.
Red Ewald, Inc.
Fimco, Inc.
Friend Mfg. Co.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
F. E. Myers & Bro. Co.
Root-Lowell Corp.
Solo Motors, Inc.

SPRAYERS, COMPLETE POWER UNIT
(Also See Pumps)
Ag. Machinery Div., FMC Corp.
John Blue Co., Inc.
Bowie Industries, Inc.
The Broyhill Co.
Buffalo Turbine Ag. Equip. Co.
Century Engineering Corp.
Contree Sales, Inc.



HELP AVAILABLE

to plan and budget your 1974 grounds maintenance improvements.



As you prepare your budget for next year's grounds maintenance—seeking better results without inflationary labor cost—possibly we can help.

Berkeley has great capability in this area. First, as a full-line manufacturer of every type of pump used in water systems and sprinkler irrigation, and with experience gained over nearly four decades. Also with a dealer organization in most urban, suburban and rural areas of North America. Plus a factory branch and warehouse system geared to urgent demands both for original equipment and spare parts.

But most of all, because basically we are hydraulic engineers. Thus we tend to load our dealers with all the information they need to advise people in your position on designing a system adequate for present and projected requirements. Sound information so a system is never overbuilt or underbuilt.

As a convenience, the names of our dealers are listed in the Yellow Pages of hundreds of telephone directories. If you don't find one locally, please call us. We will help you with your plans and budget one way or another.

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P.O. Box 2007, Berkeley, California 94702 • 415/843-9400
556 Tift Avenue, S.W., Atlanta, Georgia 30310 • 404/522-5387

BRANCHES IN Amarillo, Tex.; Grand Island, Neb.; Dallas, Tex.; Portland, Ore.; Phoenix, Ariz.; Commerce City, Colo.; Cherry Hill, N.J.; Tampa, Fla.; Joplin, Mo.; St. Louis, Mo.; Minneapolis, Minn.; Ajax, Ontario, Canada.

For More Details Circle (108) on Reply Card

Cushman, OMC-Lincoln
Deere & Co.
Edwards Manufacturing Co.
Red Ewald, Inc.
Fimco, Inc.
Friend Manufacturing Corp.
The Guildsman Company
Hub States Corporation
H. D. Hudson Mfg. Co.
Hydro Turf
L. L. Larson Machine, Inc.
Lawn Medic, Inc.
Lockwood Corporation
London Fog Company
Mars Industries, Inc.
F. E. Myers & Bro. Co.
National Foam System Inc., Parco Div.
Robco, Inc.
Root-Lowell Corporation
Smith & Co., Inc. D. B.
Smithco, Inc.
Solo Motors, Inc.
Tradewinds, Inc.
Tree Ject Company
Universal Div. of Leigh Prod., Inc.
The Vandermolen Co.
Walsh Manufacturing Co.
Waymark
Wayne Engineering Corp.

SPRAYERS, COMPRESSED AIR
Curtis-Dyna Products Corp.
Red Ewald, Inc.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
Parco Div., National Foam
Root-Lowell Corp.

SPRAYERS, HAND
Bartlett Mfg. Co.
Broyhill Co.
Buffalo Turbine Ag. Equip. Co.
Century Engineering
Contree Sales, Inc.
Deere & Co.
Friend Mfg. Co.
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
Melnor Industries, Inc.
Parco Div., National Foam
Root-Lowell Corp.
Solo Motors, Inc.
Tradewinds, Inc.
Universal Div. of Leigh Prod., Inc.
The Vandermolen Co.
Walsh Manufacturing Co.

SPRAYERS, HOSE END
Ag. Machinery Div., FMC Corp.
Amchem Products, Inc.
Bar-Way Mfg. Company
Broyhill Co.
Century Engineering Corp.
Friend Mfg. Co.
Hayes Spray Gun Co.
Hub States Corporation
H. D. Hudson Mfg. Co.
L. L. Larson Machine, Inc.
Melnor Industries, Inc.
F. E. Myers & Bros. Co.
Tree Ject Company
Universal Div. of Leigh Prod., Inc.
Walsh Mfg. Co.
Wayne Engineering Corp.

SPRAYERS, KNAPSACK
Bartlett Mfg. Co.
Buffalo Turbine Ag. Equip. Co.
Friend Mfg. Co.
H. D. Hudson Mfg. Co.
National Foam System, Inc., Parco Div.
Public Health Equip. & Supply Co.
Robco, Inc.
Root-Lowell Corp.
Solo Motors, Inc.
Stihl American, Inc.
Tradewinds, Inc.
Vandermolen Co.

SPREADERS, DISC-TYPE
L. L. Larson Machine, Inc.
The Vandermolen Co.
Waymark

SPREADERS, HOPPER-TYPE
Arctic Mizer
Avco Ezee Flow Div.
John Blue Co.
Cushman, OMC-Lincoln
Deere & Co.
Ford Tractor Operations, North America
Gandy Co.
Great Lakes Chemical Div.
Herd Seeder Co., Inc.
Highway Equipment Co.
International Harvester Co.
F. D. Kees Mfg. Co.
L. L. Larson Machine, Inc.
Lely Corp.
Ryan, OMC-Lincoln
Simplex Mfg. Co.
Swenson Spreader & Mfg. Co.
TCI, Inc.
Vandermolen Corp.
Willmar Mfg. Co.

SPREADERS, LIQUID
Amchem Products, Inc.
TCI, Inc.

SPRIGGERS
Beck Manufacturing Co.
Bermuda King Co.
Bowie Machine Works

SPRINKLERS
(See Irrigation)

STENCILS, MARKING
Fox Valley Marking Systems
M-B Company

STONE PICKER
(Also See Rock Picker)
Armor Metal Products
William Bergman Company
Bridgeport Implement Works, Inc.
Lockwood Corp.

STRAINERS
Hypro Division, Lear Siegler, Inc.

STRAINERS, SUCTION
Bar-Way Mfg. Co.

STUMP CUTTER/REMOVER
Arps Corp.
Hesston Corp., Lawn Equipment Div.
International Harvester Co.
Karl Kuemmerling, Inc.
Levco Manufacturers, Inc.
Municipal & Industrial Service Equip. Div., FMC Corp.
Valley Products Corporation
Vermeer Manufacturing Co.

SWEEPERS, LAWN
(Also See Broom, Vacuum)
Billy Goat Industries, Inc.
Deere & Co.
International Harvester Co.
Jacobsen Mfg. Co.
Lindell Pattern Works
M-B Company
Mars Industries, Inc.
Mathews Company
Melroe Mfg. Co.
Municipal & Industrial Service Equip. Div., FMC Corp.
Nunes Manufacturing
Parker Sweeper Co.
Rental Equipment Mfg. Co.
Ryan, OMC-Lincoln
Sweepster, Jenkins Equip. Co.
Tennant Maintenance Systems
The Toro Company
Turf Vac Corp.
Wheel Horse Products, Inc.

TAILGATES, LIFTING
Adventure Line Mfg. Co.
S & H Industries, Inc.

TANKS, SPRAY
Ag. Machinery Div., FMC Corporation
John Blue Co.
The Broyhill Co.
Century Engineering Corp.
Contree Sales
Edwards Manufacturing Co.
Red Ewald, Inc.
Fibre Glass Products
Friend Manufacturing Corp.
Hemco Corporation
H. D. Hudson Mfg. Co.
Inject-O-Meter Mfg. Co.
L. L. Larson Machine, Inc.
F. E. Myers & Bros. Co.
Papec Machine Co.
Raven Industries
Root-Lowell Corporation
Universal Div. of Leigh Prod., Inc.
Walsh Manufacturing Co.

THATCHERS
(See Mowers, Vertical)
Arctic Mizer
Arps Corporation
Giant-Vac Mfg., Inc.
Parker Sweeper Company
Rental Equip. Mfg. Co.
Ryan, OMC-Lincoln
Swenson Spreader & Mfg. Co.
Triumph Machinery Co.

TILLERS
Allis-Chalmers
Ariens Co.
Auto Hoe Inc.
Contree Sales, Inc.
Deere & Co.
Engineering Products Co.
Ford Motor Co., Tractor Div.
Howard Rotavator Co., Inc.
International Harvester Co., Inc.
Jacobsen Mfg. Co.
Lakes Supply Co., Inc.
Lely Corp.
Massey-Ferguson, Inc.
MTD Products, Inc.
Outdoor Power Equip. Div., FMC Corp.
Roseman Mower Corporation
Roto-Hoe Co.
Side-Winder Plant, FMC Corp.
Simplicity Mfg. Co.
Solo Industries, Inc.
Village Blacksmith
Wheel-Horse Products
Yazoo Mfg. Co., Inc.

TIRES
Dunlop Tire & Rubber Corp.

TOOLS, HAND, HYDRAULIC, PNEUMATIC
Black & Decker Co.
Deere & Co.
Friend Mfg. Corp.
F. D. Kees Mfg. Co.
Limb Lopper Co., Inc.
H. K. Porter, Inc.
Seymour Smith & Son, Inc.
Village Blacksmith

TOOL BOXES, PICKUP
(See Chests, Tool)
Hemco Corporation
Knaack Mfg. Co.

TOP DRESSERS
Cushman, OMC-Lincoln
Jabobsen Mfg. Co.
Lely Corp.
Ryan, OMC-Lincoln
Smithco, Inc.

WHAT MAKES DITCH WITCH THE LEADER?

PRODUCT Ruggedness, dependability, ease of operation and low maintenance costs — just some of the reasons the Ditch Witch J20 is the leader in its class. This 18-horsepower trencher has the price and size of a compact, with design advantages of bigger Ditch Witch models. The J20 gives you rigid-frame construction for stability and safety, four-wheel drive with a choice of tire options, auto-type power steering and full hydraulic convenience controls, a fully-hydraulic backfill blade and much more. The digging chain is driven directly through the J20's three-speed transmission while travel speed during trenching is controlled hydraulically. Why not let Ditch Witch demonstrate the J20 on your job site? See for yourself why Ditch Witch is the leader.

PEOPLE The industry's leading dealer organization helps maintain Ditch Witch's role of leadership. Ditch Witch dealers do their best to supply equipment that fits each customer's individual needs. Then they support their product line with unmatched service. With Ditch Witch, an obligation *begins* with every sale. If you need a part, your dealer will get it to you — fast. If something goes wrong, his factory-trained servicemen will fix it. Every Ditch Witch dealer is a trained professional who believes in his product. He treats each customer honestly and fairly and provides the best possible service. Is it any wonder Ditch Witch is the leader?

FOLLOW THE LEADER!

DITCH WITCH

. . . offering a full line of trenching equipment from 7-HP to 65-HP.

CHARLES MACHINE WORKS, INC., P. O. Box 66, Perry, Oklahoma 73077

For More Details Circle (142) on Reply Card

TRACTOR, 8-12 HP
AMF Western Tool Division
Allis-Chalmers Corp.
Ariens Company
Avco New Idea
J. I. Case
Deere & Co.
Ford Tractor Operations, North America
International Harvester Co.
Massey-Ferguson, Inc.
Simplicity Mfg. Co.
Smithco, Inc.
Speedex Tractor Co.
Wheel-Horse Products
Yardman, The Leisure Group, Inc.

TRACTOR, 13-20 HP
Allis-Chalmers Corp., Outdoor and Leisure Products
Avco New Idea
J. I. Case
Deere & Co.
Economy Tractor
Ford Tractor Operatons, North America
General Electric, Outdoor Power Equip. Operations
Hesston Corporation, Ind. Div.
International Harvester Co.
Kubota Tractors, Inc.
Massey-Ferguson, Inc.
Outdoor Power Equip. Div., FMC Corp.
Simplicity Mfg. Co.
Speedex Tractor Co.
Tradewinds, Inc.
Wheel-Horse Products
Yardman, The Leisure Group, Inc.

TRACTOR, 21-60 HP
Allis-Chalmers
J. I. Case
Deere & Co.
Ford Tractor Operations, North America
International Harvester Co.
Kubota Tractors, Inc.
Massey-Ferguson, Inc.
Satoh Tractor c/o NEDA
Slope Tractor, Inc.
Tradewinds, Inc.
Waldon, Inc.

TRACTORS, 61-150 HP
Allis-Chalmers
J. I. Case
Deere & Co.
Ford Tractor Operations
Massey-Ferguson, Inc.
Waldon, Inc.

TRACTORS, 151 and up HP
Deere & Co.
Ford Tractor Operations
International Harvester
Massey-Ferguson, Inc.
Waldon, Inc.

TRACTOR, CRAWLERS
Allis-Chalmers
Deere & Co.
International Harvester Co.

TRAILERS
Beatty Trailers
The Champion Co.
Clark Equipment Trailer Div.
Deere & Co.
Fayette Division, Dayton-Walther Corp.
Harvestall Industries, Inc.
Jacobsen Mfg. Co.
Lakeside Mfg. Corp.
Lawn Medic, Inc.
Magline, Inc.
Maxey Manufacturing Co., Inc.
Miller Tilt-Top Trailers, Inc.
Rogers Bros.
E. R. Schwartz Mfg. Co.
Selma Trailer and Mfg. Co.
The Snow Company
Trailevator Div., Magline, Inc.
Wheel Horse Products, Inc.

TRASH COMPACTORS
Air Rake Manufacturing Corp.
Piqua Engineering, Inc.

TREE INJECTORS
Creative Sales
Ferti-Feeder
Tree-Ject Company

TREE MOVERS
(See Spade, Tree)
CareTree Systems
Davey Tree Expert Co.
Ideal Crane Div.
Schutt's Equipment Co.
Vermeer Manufacturing Co.

TREE WRAPPINGS
Bartlett Mfg. Co.
Bemis Mfg. Co.
American Excelsior Corp.

TRENCHER
Arps Corp.
Charles Machine Works
Davis Mfg.
Digz-All Trencher Co.
Ground Hog, Inc.
Moody Sprinkler Co., Inc.
Toro Irrigation Division
Towner Mfg. Co.
Vermeer Mfg. Co.

TRIMMERS, HEDGE AND GRASS, PARTS
Bartlett Mfg. Co.
The Black & Decker Mfg. Co.
Bunton Co.
Gandy Company
Goodall Div.
Grandberg Industries
HMC
Jacobsen Mfg. Co.
K-D Mfg. Co.
Lindell Ind., Div. Lindell Pattern Works
Melnor Industries, Inc.
H. K. Porter, Inc.
Rowco Mfg. Co., Inc.
Seymour Smith & Son, Inc.
Stihl American, Inc.
Tallman Equip. Co. Inc.
Village Blacksmith
Yazoo Mfg. Co., Inc.

TRUCK, ACCESSORIES
Maxey Manufacturing Co. Inc.

TRUCK, FORESTRY
Asplundh Chipper Co.
Mobile Aerial Towers, Inc.

TRUCK, LIGHT-HAULING, UTILITY
Cushman, OMC-Lincoln
HMC
Jacobsen Mfg. Co.
Wayne Engineering Corp.

TRUCK, UTILITY BODIES
Fibre Glass Products

TUBING
(Also See Hose)
American Hose & Reel Co.

TURF VEHICLES
Club Car, Inc.
Cushman, OMC-Lincoln
HMC
Jacobsen Manufacturing Co.
Jeep Corporation
Otis Elevator Company, Special Vehicle Div.
Ryan, OMC-Lincoln
Smithco
The Snow Company
The Toro Company
Wheel Power Corp.

UNDERWATER WEED HARVESTER
(See Aquatic Weed Harvester)
A.O.A. Research & Development, Inc.
Air-Lec Industries, Inc.
Aquamarine Corporation
Aquanautics, Inc.
Aquatic Controls Corp.
Mud Cat, Div. of National Car Rental
The Vandermolen Co.

UNDERWATER WEED RAKE
Aquanautics, Inc.
Aquatic Controls Corp.

UNLOADERS
Dico Co., Inc.

UTILITY TRAILERS
Beck Mfg. Co.
Miller Tilt-Top Trailers, Inc.
Trailevator Div., Magline, Inc.

VACUUMS
Air Rake Manufacturing Corp.
Alis-Chalmers Mfg. Co.
Arctic Mizer
Ariens Co.
Billy Goat Industries, Inc.
The Black & Decker Mfg. Co.
Deere & Co.
E-Z Rake, Inc.
Giant-Vac Mfg. Inc.
Hesston Corp., Lawn Equipment Div.
Jacobsen Manufacturing Co.
Lindell Industries, Div. of Lindell Pattern Works
MTD Products, Inc.
Nunes Manufacturing
Parker Sweeper Co.
Ryan, OMC-Lincoln
Simplicity Mfg. Co., Inc.
Sweepster, Jenkins Equip. Co.
Swenson Spreader & Mfg. Co.
Tennant Maintenance Systems
Turf Vac Corp.
Wheel-Horse Products

VALVES
(Also See Irrigation Valves)
Aqua-Dial
Hypro Division, Lear Siegler, Inc.
Inject-O-Meter Mfg. Co.

VALVE BOXES
Ametek, Plymouth Plastics Division

VERTICAL SLITTERS, TURF
Rental Equipment Mfg. Co.
Ryan, OMC-Lincoln

VIBRATORY PLOWS
Charles Machine Works
Davis Mfg.

WASHERS, HIGH PRESSURE
Century Engineering Corp.
Fimco, Inc.
Walsh Mfg. Co.
Wayne Engineering Corp.

WEED BARRIER
Sea Guard, Inc.

WELDERS
American Lincoln Corp.

WINCH
(Also See Hoist)
Fairmont Hydraulics
Hoffco, Inc.
Ideal Crane Div.
International Harvester Co.
Maasdam Pow'r Pull, Inc.

He's got a horse. Wheel Horse, of course!

When your business depends on a lawn and garden tractor, it's important that you have the right tractor. That's why the Wheel Horse ABCD's of tractoring is so important to you. It gives you four series of tractors from which to choose. Once you've decided on the horsepower and features of a particular series, you can choose a model that most nearly fits your needs. It's as simple as:

A **The economy line,** featuring the A-800 Ranger electric and recoil start tractors. For mowing small to medium-size lawns. A 32″ mower is standard. Dimensions for A Series tractors: Width, 30½″; Length, 56″; Height, 36½″.

B **Compact value leaders,** recommended for intermediate-size lawns and small gardens. This series includes the B-80 4-speed and the B-100 Automatic. Dimensions for B Series tractors: Width, 35″; Length, 63″; Height, 40″.

C **Tractors with more power, more versatility,** designed for medium or large-size lawns and gardens. A choice of four C Series models is available — the C-120 and C-160 Automatics and the C-100 and C-160 8-speeds. Dimensions for C Series tractors: Width, 36″; Length, 65″; Height, 43″.

D **Top-of-the-line Wheel Horse tractors,** big on horsepower and exciting features. The D-200 Automatic, with a 19.9 HP twin-cylinder engine, is the biggest, toughest Wheel Horse tractor yet. Designed for large lawns and gardens, the D Series also offers the D-180 and D-160 Automatics. Dimensions for D Series tractors: Width, 45″; Length, 75″; Height, 45″.

With the ABCD's of tractoring, Wheel Horse also offers 29 attachments to give professional results to all the outdoor maintenance work you do...to save you time...and to add to your profits.

Get the complete story today at your Wheel Horse dealer. Ask him for a free copy of our new 1974 catalog or write to us.

Wheel-Horse Products, Inc.
Dept. WTT, 515 W. Ireland Road, South Bend, Indiana 46614

The basics of tractoring are as simple as A B C D ...by Wheel Horse, of course.

WHEEL HORSE
lawn & garden tractors
515 West Ireland Road., South Bend, Indiana 46614

Yellow Pages

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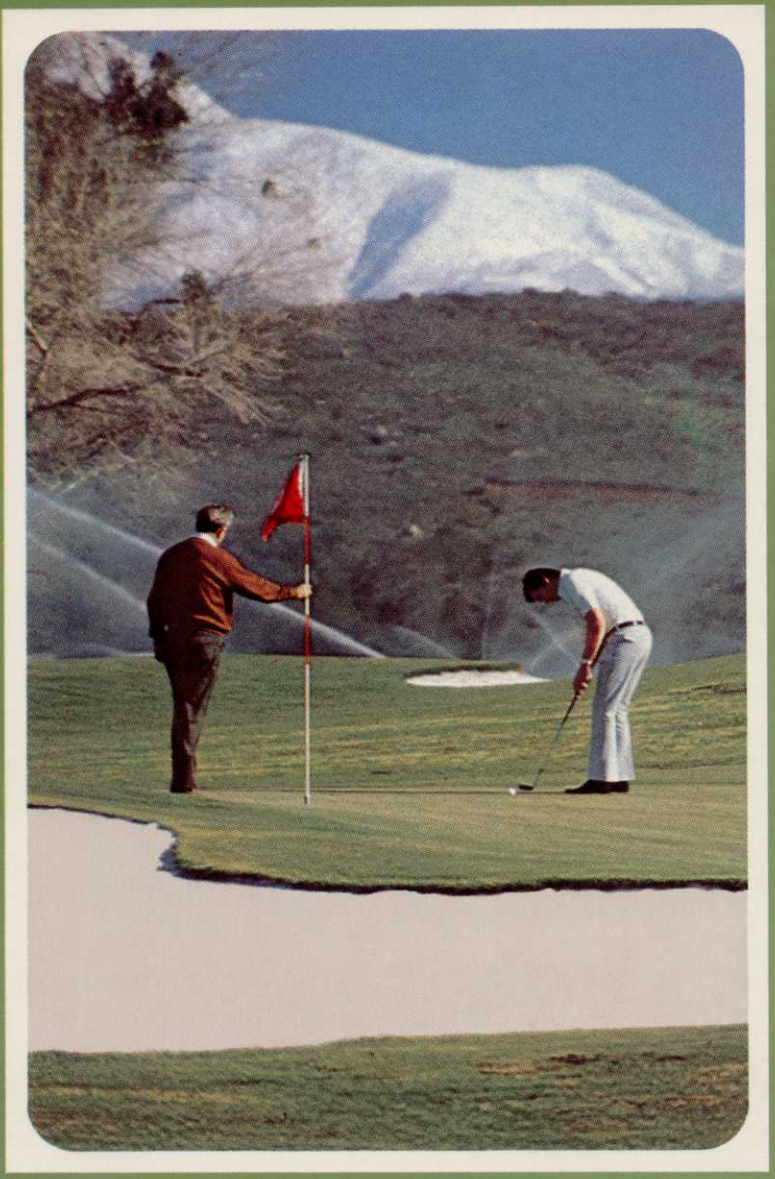

San Vicente C. C./Ramona, California
Ready for play one year after start of construction.

Choosing an automatic controlled system should be like going to a good smorgasborg: the more you have to choose from, the greater your satisfaction will be.

That's why it's important to get together with Buckner during your initial planning stage. Because Buckner makes seven different types of controllers—more than anybody else.

And that means that Buckner can work with these seven systems to deliver exactly the control system your course should have. These systems range from sophisticated two-wire, solid-state set-ups to basic units where cost is the prime requisite:

Binar® offers the ultimate in two-wire central control. Eliminates field controllers and miles of costly wire. Solid state circuitry provides trouble-free performance. You can scramble individual control valves for maximum program flexibility.

CP-2 provides advanced central programming where field controllers are needed for on-course inspection and maintenance. Syringe and omit cycles. Watering of fairways, tees and greens can be completed in less than nine hours.

711 is the perfect automatic in-field controller for large turf areas. This 11-station system features 0-60 minute control. Waters fairways, greens and tees in less than nine hours.

The ICM series offers three systems: The 12E has 12 control stations, the Dual 12E has two 12E units with two clocks, and the 24E has 24 control stations and one clock, where longer watering times are permissible.

The BR-10 delivers dependable performance at a rock bottom price for a dual program with ten stations.

If you're planning new watering systems, now's the time to get together with the Buckner Agri-turf Division of Johns-Manville. We'll take the time to figure out exactly what you should have. Then we'll supply it. Because we have more kinds of controllers, heads, valves and pipe than anybody in the business.

Buckner®

Agri-turf Division, Johns-Manville, P.O. Box 232, Fresno, Ca. 93708

Now you can get exactly the automatic control you need:

Because we make more automatic controllers than anybody else.

Buckner Agri-turf Division, Johns-Manville can do more for you. Because we have more to work with.

☐ I'd like information on Buckner automatic control systems.
☐ I'd like to talk to a Buckner expert about a Buckner system.

Name_____ Title_____

Address_____

City_____ State_____ Zip_____

Telephone_____

Dept WTT

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Green Industry Associations Report Objectives And Goals

EDITOR'S NOTE: Accomplishments by an industry as new and dynamic as the Green Industry can best be achieved through organizations and associations. Bodies of people united for a common cause, sharing in the mistakes, rejoicing in the rewards, active as a unit, and aggressive as a team—these are the qualities which build industry-wide recognition. These are the attributes which distinguish dynamic from static. These are the parameters of success.

In November, WEEDS TREES AND TURF polled leading organizations of the Green Industry. We asked, in addition to identifying information, for three organization objectives which were met in 1973. Further, we requested the organizations to state three goals they planned to achieve in 1974. Their answers are given below.

ASSOCIATED LANDSCAPE CONTRACTORS OF AMERICA, INC.

1750 Old Meadow Road, McLean, Virginia 22101.
Tel. (703) 893-5440

Thomas Hal Stewart, Executive Director

Officers and Directors: Jerry J. Lankenau, president; Ralph Stout, Jr., president-elect; Lew Hammer, vice president; Ronald A. Ahlman, vice president; Duane Nelson, Secretary; William C. Byers, Treasurer; Norman Gray, past president. Regional Directors: Jack Brem; Philip Thorson; Wally SaBell; Vern Smith; Larry Bisel; Jake Branyon; Roy Zehren; Dick Brickman; John D/Ginto; Ritch Skelton; Robert Hutt; Ed Helmke; Jerry Murdock; Isaiah Crosby. Directors At Large: Joe Korematsu; David Johnson; Bill Thornton; George Hederhorst; Ray Gustin, III. Associate Directors: Tom Edgren; Parker Shirling; Tom Clark; Wil Schulze; James Chester; Sandy Lee.

Total membership: 400.

OBJECTIVES MET IN 1973: 1. Publication of *Planting Specifications,* jointly produced by ACLA and the American Society of Landscape Architects; 2. Publication of *Handbook of Landscape Architectural Construction,* jointly produced by ALCA and the American Society of Landscape Architects; 3. Publication of *Handbook of Business Forms For The Landscape Contractor.*

GOALS TO ACHIEVE IN 1974: 1. Series of local meetings of landscape contractors under the sponsorship of ALCA to bring problems and solutions to the grassroots level. 2. Task Force meeting on single problems between landscape contractors and landscape architects at several points across the country; 3. Publication of Contracts and General Conditions which will have been accepted jointly by ALCA and ASLA.

AMERICAN SOCIETY OF CONSULTING ARBORISTS

12 Lakeview Avenue, Miltown, New Jersey 08850.
Tel. (201) 821-8948

Spencer H. Davis, Jr., Executive Director

Officers and Directors: Walter P. Morrow, Sewickley, Pa., president; W. Roland Shannon, Milford, Pa., president-elect; O. J. Andersen, Houston, Tex., vice president; F. Earle Martin, Toronto, Ont., Canada, secretary-treasurer; L. C. Chadwick, Columbus, Ohio, past president. Directors: Leslie S. Mayne, Burlingame, Cal.; Frederick R. Micha, Rochester, N.Y.; William P. Lanphear, Cleveland, Ohio; Charles H. Michler, Lexington, Ky.

Total membership: 100.

OBJECTIVES MET IN 1973: 1. Increased materials in case history files for member use; 2. Increased publicity which resulted in increased requests for ASCA Membership Directory; 3. Increased background materials on legal aspects of tree evaluations.

GOALS TO ACHIEVE IN 1974: 1. More realistic methods for evaluations of shade trees and acceptance by Internal Revenue Service; 2. Closer association with insurance adjustors and their viewpoints on tree evaluations; 3. Continued increase in publicity for ASCA.

AMERICAN SOD PRODUCERS ASSOCIATION

Association Building, 9th and Minnesota, Hastings, Nebraska 68901.
Tel. (402) 462-5515

Bob Garey, Executive Director

Officers and Directors: Jack Kidwell, Kidwell Turf Farms, Culpeper, Va., president; Charles Davis, Wharton Turf Grass, Inc., Wharton, Tex., vice president; Gerry Brouwer, Brouwer Sod Farm, Ltd., Keswick, Ont., Canada, secretary; J. F. Nunes, Jr., Nunes Turfgrass Industries, Patterson, Calif., treasurer; Tobias Grether, Cal-Turf, Inc., Camarillo, Calif., past president. Directors: Paul Florence, Paul Florence Turfgrass, Marysville, Ohio; Wallace A. Huggett, Sod Farm, Inc., Marlette, Mich.; Parker Shirling, Princeton Turf Farms of Md., Centerville, Md.; William Latta, Princeton Turf of Kansas City, Kansas City, Mo.

Total membership: 234.

OBJECTIVES MET IN 1973: 1. Extensive circulation of specifications in the utilization and installation of sod for the use of architects, contractors, governmental agencies and other individuals and entities. Through this standardization manual, the user as well as the sod industry have been able to do the finest job in meeting requirements of the consumer; 2. The staging of two successful nationwide meetings, the annual mid-winter conference held in Hawaii wherein financial management, tax planning, tours of agriculture projects, and fun were on the program. The annual summer meeting and field day in Denver found equipment manufacturers demonstrating the latest in sod harvesting machines, power equipment and all the related products which are

desirable and necessary in the production and installation of sod. In addition, the formal program included accounting for sod producers, utilizing the ASPA Standardized Accounting System, labor relations determining seed quality, nematodes and the annual business session; 3. continued advancement of the association in the securing of a professional association management organization to continue the growth and development of the association, expanded programs and to meet the additional need of the association as it expands.

GOALS TO ACHIEVE IN 1974: 1. Greatly expanded membership and participation in all three categories of producers, suppliers and educational extension; 2. greater involvement with Federal regulatory agencies so as to minimize governmental control and regulation consistent with good citizenship. To secure favorable interpretations as to the nature of sod production and installation so as to enable the industry to operate efficiently; 3. Expanded educational activities, with both winter educational conference and summer convention equipment demonstrations designed to provide the maximum in practical information which can be applied to the operation of each member. The development of improved association communications through regular printed and periodic publications and bulletins is consistent with education and thus is of direct benefit to the members.

GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA

1617 St. Andrews Drive, Lawrence, Kansas 66044
Tel. (913) 841-2240

Conrad L. Scheetz, Executive Director

Officers and Directors: Clifford A. Wagoner, CGCS, president; Charles G. Baskin, CGCS, vice president; Palmer Maples, Jr., CGCS secretary-treasurer; Robert V. Mitchell, pesident emeritus. Directors: George W. Cleaver, CGCS; Richard W. Malpass, CGCS; Carlton E. Gipson; Gordon C. Witteveen, CGCS; Ted W. Woehrle, CGCS.

Total membership: 3550.

OBJECTIVES MET IN 1973: 1. November 19, 1973 marked the conclusion of the Association's headquarters relocation, with the occupancy of its newly completed office, the first constructed and owned by the organization in its 47 year history; 2. A public relations-communications staff member was added to the headquarters staff in July. As a result of this hiring, a number of Association brochures are being up-dated, with new materials and additional services being planned; 3. Closer working relationships were established between GCSAA and its allied associations, the PGA and CMAA, through increased cooperation and joint planning meetings.

GOALS TO ACHIEVE IN 1974: 1. The Association's educational programs will be increased and improved to better meet the individual member's personal needs. This will be accomplished through the offering of multi-level educational programs, including regional seminars, and by upgrading the available audio-visual teaching aids through the addition of slide and film presentations; 2. In the coming year, through a variety of publications and talks, golf course superintendents, golf course officials and the golfing public in general will be provided new information relevant to the superintendent's role and his importance to golf. In addition, emphasis will be placed on making people aware of the advantages and values of membership in GCSAA, not only to the superintendent, but also to the golf course and to the game of golf; 3. GCSAA plans to continue assisting the golf course superintendent improve his managerial capabilities through the utilization of a multi-media program which will include THE GOLF SUPERINTENDENT, informational brochures, films, etc. Of prime importance this coming year will be the existing and impending shortages of many basic golf course maintenance necessities such as manpower, fule, fertilizer, parts, seed, etc., and the increase of government regulations which pertain to golf courses.

INTERNATIONAL PESTICIDE APPLICATORS ASSOCIATION, INC.

221 First West, Seattle, Washington 98119
Tel. (206) 284-4774

Ralph V. Backstrom, Executive Director

Officers and Directors: Donald R. Mock, Seattle, Wash., president; Robert Huntwork, Concord, Calif., vice president; Lew Sefton, Lake Oswego, Oregon, corporate secretary. Directors: Bob Skanes, Tacoma, Wash.; Jack Daniels, Seattle, Wash.; George Harrison, Seattle, Wash.; Rod Fairbanks, Seattle, Wash.; Stan Raplee, Seattle, Wash.; Bill Gildroy, Lake Stevens, Wash.; Gary W. Mulkey, Junction City, Ore.; Bill Owen, Clackamas, Ore.; Charles E. Seibold, Portland, Ore.; Milt Ellis, Portland, Ore.; Ray Collier, Portland, Ore.; Jim Stevenson, Oakland, Calif.; Paul G. Walker, San Diego, Calif.; Jim Osborn, Danville, Calif.; Alvin J. Wallman, Sonoma, Calif.; Don Caldwell, Salt Lake City, Utah.

Total membership: 106.

OBJECTIVES MET IN 1973: 1. Establishment of a permanent and adequately paid executive secretary with clearly defined duties and responsibilities; 2. Steady improvement through increasingly effective submissions for publication in The Professional Applicator; 3. Established liaison with other Green Industry organizations for greater collective effectiveness in telling our story and reaching our individual and joint objectives.

GOALS TO ACHIEVE IN 1974: 1. Attempt to so organize Board of Directors activities that annual conference meeting could become the only full board meeting needed within the year, with strong committee activity carrying the load during the year; 2. Develop more local talent for eventual improvement in board activities of IPAA; 3. Emphasize strongly greater inter- and intra-chapter influence on legislation, local and national which affects professional application of pesticides.

INTERNATIONAL SHADE TREE CONFERENCE, INC.

3 Lincoln Square, P.O. Box 71, Urbana, Illinois 61801
Tel. (217) 328-2032

E. C. (Cal) Bundy, Executive Secretary

Officers and Directors: F. Lewis Dinsmore, Dinsmore Tree Service, St. Louis, Mo., president; John Z. Duling, Duling Tree Expert Co., Muncie, Ind., president-elect; Jack R. Rogers, Superintendent of Street Trees, Los Angeles, Calif., vice president; E. B. Himelick, Illinois Natural History Survey, Urbana, Ill., executive director; Dan Neely, Illinois Natural History Survey, Urbana, Ill., editor.

Total membership: 2251.

OBJECTIVES MET IN 1973: 1. Finalized the revised Constitution and Bylaws as adopted by the membership at the 1973 Convention in Boston; 2. Realized the approval and distribution by the American National Standards Institute of the much needed publication "National Standards for Tree Pruning and Trimming" as formulated by a national committee sponsored by the I.S.T.C.; 3. Provided a group insurance program for the association members with the assistance of the Fred S. James Company, San Francisco, Calif.

GOALS TO ACHIEVE IN 1974: 1. Will complete the revision work of two out-of-print publication entitled "Transplanting of Trees and Shrubs" and "Opportunities in Arboriculture;" 2. Will have all back issues and indexes of our monthly magazine "Arborist News" microfilmed for sale and distribution to libaries, institutions, and individuals; 3. Will observe and celebrate 50 years of existence in 1974 by planning the best possible educational program at out annual convention in Atlanta, Ga. In addition, I.S.T.C. will realize the formation of a new chapter in the State of New Jersey.

NATIONAL ARBORIST ASSOCIATION

1750 Old Meadow Road, McLean, Va. 22101
Tel. (703) 893-7374

Robert C. LaGasse, Executive Secretary

Officers and Directors: John A. Shullenbarger, president; W. Roland Shannon, vice president; Thomas A. Morrison, secretary; Boyd Haney, treasurer; Gerald E. Farrens, director; Larry Holkenborg, director; Kenneth Kirk, director; Robert Felix, past president.

Total membership: 213

OBJECTIVES MET IN 1973: 1. The NAA Professional Home Study Program was revised and reprinted as a continuing service to its members and the industry; 2. Published the "Handbook on Forma" which lists over 200 business forms currently being used through the tree care industry. The purpose of the Handbook is to offer members an unparalleled resource by which they can compare the individual needs of commercial tree care companies; 3. Planted the first live national Christmas tree in over 20 years. Working in cooperation with the National Park Service and the Department of Interior, the NAA located, secured, transported and planted a 40 foot Colorado Blue Spruce which will serve as the official Christmas tree for the next 100 years. It is located just behind the White House.

GOALS TO ACHIEVE IN 1974: 1. Emphasize the updating of business education among the members of NAA for the better operation of tree care companies; 2. Research and distribute publicatons on specific technical problems experienced by the tree care industry, such as disposal problems, company policies and procedures, the "energy crisis," industry spray practices and other topic vital to the operation of commercial tree care companies.

SPRINKLER IRRIGATION ASSOCIATION

13975 Connecticut Avenue, Suite 310
Silver Spring, Maryland 20906
Tel. (301) 871-8188

Walter D. Anderson, Executive Secretary

Officers and Directors: John H. Stevens, Eugene, Ore., president; James D. Pichon, Zephyr Cove, Nev., president-elect; W. J. Ogle, Lubbock, Tex. treasurer. Directors: Paul B. Bohley, Mansfield, Ohio; Joseph Harris, Lubbock, Tex.; W. H. Lane, Bellaire, Tex.; Thomas W. Crockett, Williaimston, N.C.; Earl Morrison, Billings, Mont.; Taylor Ramsey, Eugene, Ore.; Gary Underhill, Glendora, Calif.; Kenneth B. White, Jr., Winchendon, Mass.

Total membership: 375.

OBJECTIVES MET IN 1973: 1. Publication of the first "Supplement to Sprinkler Irrigation" containing the SIA's first presentation of a section of its textbook devoted to turf irrigation; 2. Establishment of the Waste Water Resources Committee to act as an industry voice and clearing house in the area of land treatment of waste water through sprinkler irrigation in both turf and agriculture; 3. The holding of the first Sprinkler Irrigation Short Course in Fresno, Calif., in December with more than 80 enrollees and a three day program devoted to turf and agricultural principles and practices of sprinkler irrigation.

GOALS TO ACHIEVE IN 1974: 1. Publication of the completely revised and rewritten "Minimum Installation Specifications for Turf Sprinkler Irrigation Systems" expected in mid-winter; 2. Completion of a nation-wide study on licensing laws pertaining to irrigation contractors and complete analysis of existing laws to form a basis for local groups to make recommendations to state legislatures in their areas when licensing of contractors it shows to be desirable and feasible to insure quality and experienced workmanship; 3. Completion of preliminary plans for the establishment of a turf and agriculture correspondence course on sprinkler irrigation to be operated through and administered by the SIA.

WEEDS TREES and TURF
1973
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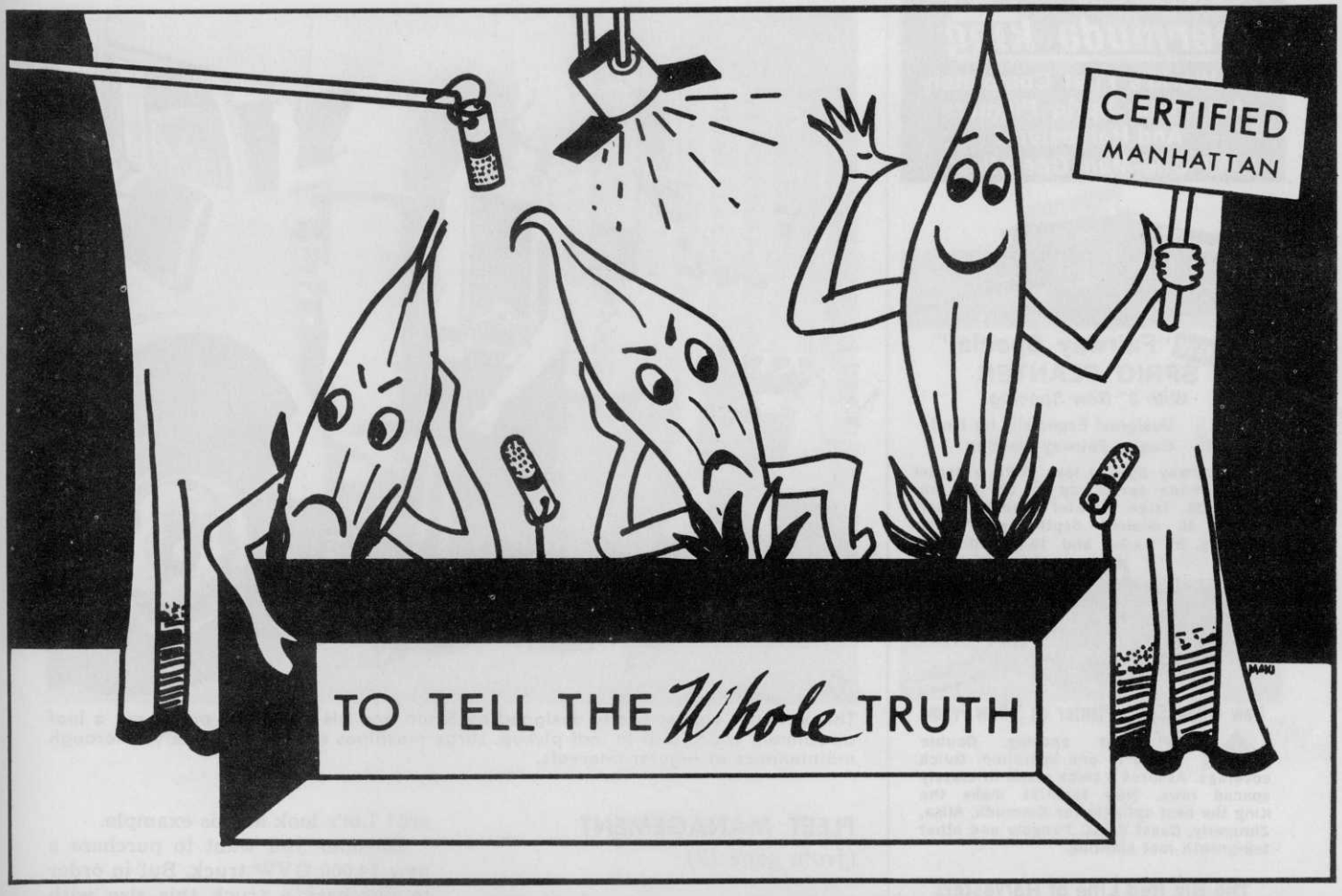

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This sweeper was specially designed by Smith and his crews. He points out a leaf attachment which aids in leaf pickup. Large machines such as this receive thorough maintenance at regular intervals.

FLEET MANAGEMENT

(from page 13)

leasing programs, open end leasing, and closed end leasing.

Open end leasing can be had with or without full maintenance. A contract is written on a mileage or hourly basis, for instance. The cycle period is 36 months, mileage limitation 45,000 miles, 3¢ thereafter, the lease makes up the balance of the purchase price when the vehicle is disposed of.

Closed end leasing can also be had with full maintenance programs. The cycle period is still 36 months, mileage limitation 45,000 miles, 3¢ thereafter. The leasee turns in vehicle at end of cycle period and completes all obligation.

Most lease agreements have a penalty clause for mileage; i.e. 60,000 to 80,000 miles pays penalty equivalent to blue book loss.

The leasee can write off 100% of lease payment as operating expense. The only tax write off is license.

In some cases it is better to purchase or own the equipment, as owned vehicles can be written off for such items as: sales tax, annual license and annual depreciation.

How should a manager decide whether to purchase one vehicle with needed options (larger axles, etc.) or the next model up which has the desired equipment as standard? Let's look at this example.

Consider you want to purchase a new 24,000 GVW truck. But in order to purchase a truck this size with components you want, it is necessary to purchase a 20,000 GVW truck and purchase optional components. I am referring to a F-700, for instance, where standard FA. 7000 pounds and an optional FA 9000 pounds compares to a standard RA. 13,000 pounds and an optional RA. 15,000 pounds. By going to a standard model F-750, it is possible to purchase the F-750 at the same price or sometimes even less. The main factor to consider would be cost.

Aerial Equipment

New regulations on vehicle-mounted elevating and rotating work platforms have brought new meaning into the purchase of aerial equipment. Due to a personnel accident some years back, we have established a preventive maintenance program on aerial ladders, cranes and personnel platforms for the City of Los Angeles. This program meets the State of California and manufacturer's recommendations. The program now in effect meets or exceeds OSHA requirements.

First, we are required to install a safety bar inside the bucket to fasten a safety belt to. This bar must be insulated on the outside of bucket, so no projected bolts can make contact

with electrical wires.

We also have established detailed series of inspections for aerial devices. They consist of: 1. Daily operators inspection in which records are turned in weekly; 2. A 90-day visual inspection of performance, controls and warning devices; 3. A one-year inspection as to lifting capacity, stability tests, electrical insulation tests and complete visual inspection of cable, hoses, and all other components; and 4. A three-year teardown inspection. This consists of dismanteling of machine, magnaflux all pins, shafts, sprockets, and shives. Replace all hydraulic lines overhaul controls, x-ray booms and replace cables.

In some ways the OSHA program follows the manufacturers recommendations. The Bureau of Transportation provides and is responsible for maintenance of same. It is our responsibility to supply and maintain the best and safest equipment possible to the using agencies.□

Spray Irrigation Effluent Yields Phosphorus To Soil

Most soils, irrigated with sewage effluent, are capable of removing unwanted phosphorus from the effluent for countless years without becoming over-saturated.

Such irrigation with sewage effluent is considered widely as feasible to meet the proposed goals of Federal legislation which would forbid disposal of critical pollutants into surface waters by 1983, stated Dr. Louis T. Kardos, professor of soil physics at Penn State University.

The phosphorus is either "fixed" or held onto by the soil, or is removed by crops through the root systems in a process termed "the living filter," Dr. Kardos explained. In medium-textured Hublersburg clay loam, for example, phosphorus has not increased below 12 inches of soil after irrigating the land with a total of 472 inches of sewage effluent over a 10 year period.

In coarse-textured Morrison sandy loam, on the other hand, 591 inches of sewage effluent applied over a 7 year period has increased the phosphorus content as far down as 3 feet. This soil is largely covered with forest. Virtually all of the phosphorus taken up by the trees is recycled through leaf litter each fall.

Water samples taken from the soil pores indicate that phosphorus leakage at 4 feet has been less than 1 percent of the total applied phosphorus on the clay loam soil. Leakage at the same depth was about 7 percent on sandy loam soil.

Regardless of the amount of effluent applied, no change was detected in phosphorus concentration in groundwater at either site.

Harvest of crops from the clay loam soil removed from 10 to 140 per cent of the applied phosphorus in the various years, Dr. Kardos stated. Such harvesting of crops contributes substantially to extending the time over which the soil can behave as an effective phosphorus filter.

Approximately 500,000 gallons of effluent are currently being sprayed daily on about 75 acres of farm and forest land at Penn State. Chlorinated secondary effluent is diverted from a sewage treatment plant into a pipeline which runs about 4½ miles to the irrigation site. Any one piece of land is irrigated only once a week. The system has been in operation since 1963.

A system irrigating four million gallons daily is now being designed to dispose of the entire effluent output from the university community.

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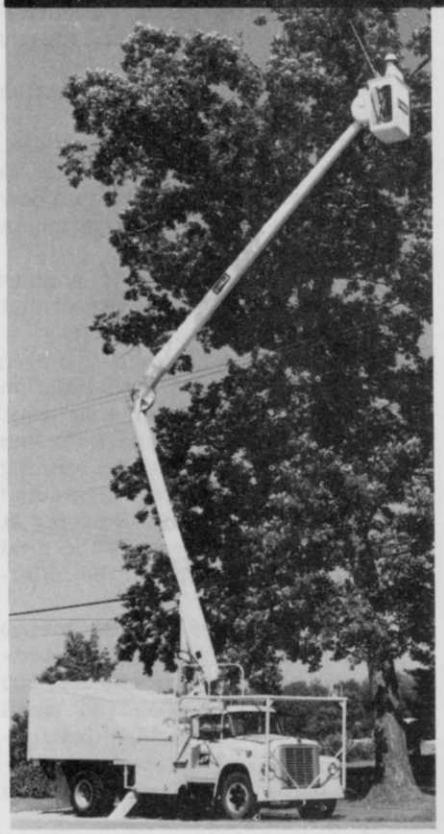

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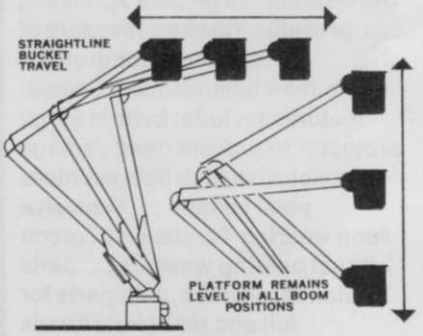

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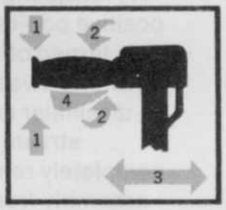

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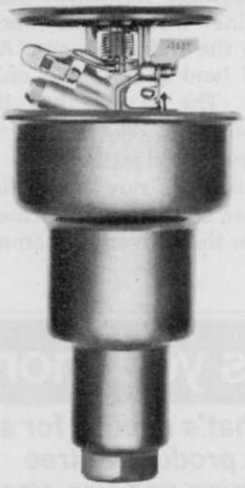

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THE METRIC SYSTEM

(from page 30)

dustry, yet the advantages of getting in step with the rest of the world are so great that business and industry are converting rapidly — already!

About 30 percent of Ford Motor Co.'s production worldwide is metric. Ford has opened a new plant at Lima, Ohio, and now is building a completely metric engine there for the Mustang II. The engines being used in the Ford Pinto, Plymouth Cricket, Dodge Colt, and Chevy LUV are already metric.

At General Motors, all new development now will be metric from the start.

John Deere is producing metrically dimensioned tractor engines here and in Europe.

IBM initiated a 10-year conversion program in 1971.

At its Hough plant at Libertyville, Illinois, International Harvester is designing and manufacturing all new products in metric measurement units.

Manufacturers of small engines will follow suit. You can expect that new designs soon will be metric.

These actions are being taken even though there has been no legislation yet. Perhaps it's better that way. With the present active participation of the United States in refining metric standards, and a gradual changeover by manufacturers at their convenience, perhaps the total cost and disruption can be minimized.

Total conversion to the metric system in the United States, according to one estimate, would cost 100 billion dollars. The cost to small engine central and service distributors and dealers will be an infinitesimal part of that. The real burden falls on manufacturers.

An estimated 10 percent of the total 100 billion dollar cost will be in what is called "soft" conversion — simply expressing measurements of our present products in metric equivalents — on drawings, on literature, on labels, on packaging, in books, in records. We would also change road signs, gasoline pump meters, and innumerable other familiar items now bearing nonmetric language.

The remaining 90 percent of the cost of going metric is in what is called "hard" conversion. "Hard" conversion means complete redesigning of products to metric measurements. That means redesigning every component in a Kohler engine. Every component in conveyor systems and lift trucks. Every gauge. Every measuring device.

E. L. Fisher is director of service, electric plant and engine division, Koehler Co. He is a graduate engineer and has served as director of service since 1970.

When the heating system in a Kohler factory is replaced, when the wiring is replaced, when the building itself is replaced, all components will be metric, from bricks and 2 by 4's to boiler pipes and light fixtures.

Convert all industry and all products to the metric system, and you can understand why the total cost has been estimated at 100 billion dollars. Keep in mind, however, that the conversion will be gradual and that the cost will be spread over 10, 20, or more years. Keep in mind, too, that if we don't convert to the metric system, we could lose many times 100 billion dollars in international trade in the next century; and that would affect the standard of living for all of us.

What does adopting the metric system mean to small engine central and service distributors and dealers?

I don't think that it will be a big problem. I don't think that it will be costly. Again, the transition will be gradual; and before you know it, you will be thinking in metric terms of inches, pounds, and gallons.

School systems are already starting to teach the metric system so that young people will be well prepared for the transition period.

The conversion to metric will increase the inventory of hardware items somewhat for small engine distributors and dealers, because they will have to carry replacement nuts and screws for today's nonmetric engines at the same time that they are "phasing in" metric parts. Other parts are unique to a particular engine anyway, unless you are dealing with a family of engines with some interchangeability of

parts. So I would conclude that the effect on inventory cost would be minimal.

Small engine distributors and dealers will have to double up on some tools during the transition period. They will need the non-metric tools they have now, but they will need metric tools also.

Many of our present tools will need no conversion. Others such as socket wrenches, open end wrenches, torque wrenches, pressure gauges, and micrometers must be sized or calibrated to the metric scale. The cost of equipping a dealership with metric tools is moderate.

Will we have to train dealers in the metric system? Probably not. For one thing, many of them already work with metric engines — snowmobile engines, motorcycle engines, diesel engines — and I suspect they worked into it without any special training in the metric system.

Also, dealers order replacement parts by part number, whether the parts are metric or non-metric.

Thirdly, at the risk of repetition, the transition will be gradual and dealers will learn to think metric and talk metric almost without realizing it.

Actually, this discussion can be summarized in a few words:

The United States is going metric. Legislation is imminent. Companies are already changing.

Small engine manufacturers are going metric. New designs are apt to be metric, while production continues for a while on non-metric models. Or we could say it this way — as older models are dropped from the product line, new products will be metric.

Small engine distributors and dealers are going metric. And they will do so at minimum cost, with minimum effort, and so gradually that they will be part of the metric world before they know it.

Along the way, we will forget a few things — like the "perfect 36." Or that time-honored saying, "An ounce of prevention is worth a pound of cure." And Texans will have to give up, or resize, the 10-gallon hat.

Required OSHA Poster Revised By Dept. of Labor

The U.S. Department of Labor has announced publication of a revised "Safety and Health Protection on the Job" poster.

The new poster, required by the Occupational Safety and Health Act of 1970 to be posted in most of the nation's workplaces, is a more detailed copy of the original notice.

Assistant Secretary of Labor John H. Stender, head of the Occupational Safety and Health Administration (OSHA), said the new poster "summarizes the provisions of the Act in easily understandable language so that both employer and employee will understand their rights and responsibilities under the law."

The revised, two-color notice includes a summary of the general responsibilities of employers and employees for creating safe and healthful workplaces. It explains the rights of an employee during an OSHA inspection, and summarizes the employee complaint procedures under the Act.

The poster also describes the citation provisions of the Act and details the various penalties that can be imposed. It also describes OSHA's commitment to voluntary compliance as an integral part of its efforts.

The poster is available, without charge, at any OSHA Regional Office. These offices are located in Atlanta, Boston, Chicago, Dallas, Denver, Kansas City, New York City, Philadelphia, San Francisco, and Seattle.

Help from Hudson on any spraying job

You name the spraying job—small, medium or large. A Hudson power sprayer can tackle it.

Take our 12½-gallon Suburban™ Trail-N-Spray™. Hitch to any compact tractor. Dependable positive piston pump—2½ gpm.

Or step up to our Matador® sprayers. Choice of 3 or 5 gpm positive piston pump. Four tank sizes: 15, 30, 50, 100 gallons.

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industry people on the move

DR. JOHN E. KAUFMANN, appointed assistant professor of turfgrass management for Cornell University. He fills the position vacated by Professor Emeritus JOHN F. CORNMAN.

* * *

DR. MICHAEL TYSOWSKY, named entomologist for the agricultural chemicals division of ICI America, Inc. **DR. DAVID H. BROOKS,** appointed research supervisor. He is on a two-year leave from the London based parent company.

* * *

EDGAR E. FEHNEL to vice president of agricultural marketing planning for Elanco Products Company. He will be responsible for product planning and coordination of agricultural products on a worldwide basis.

* * *

PAUL R. BLUM, appointed area manager for the southeastern states for Kohler Co. He will headquarter in Atlanta and work with original equipment manufacturers and Kohler engine distributors in a nine state area from Arkansas to the Carolinas.

* * *

CHARLES S. PUTNAM, elected vice president/sales for Telsco Industries. He has served as Weather-matic division sales manager for four years.

* * *

WAYNE G. RICHTER, appointed sales planning manager for consumer products manufactured by Massey-Ferguson, Inc.

* * *

FLOYD L. SIMPSON and JAMES C. BRYAN become district sales managers for Elanco Products Company. Simpson will manage sales in the Indianapolis district and Bryan will head the Cleveland district.

* * *

Addition of nine technical representatives brings to 63 the number of ProTurf representatives for O. M. Scott & Sons. New additions include: **DICK GRAY, MIKE RAINEY, FRED TOOT, STEVE SCOTT, BOB TUMEY, CHARLES LOMBARD, BEN MALIKOWSKI, CHUCK CURTIS, GERALD SWEDA.** All have backgrounds in turfgrass management, seed, irrigation, turf equipment or other specialized areas of the Green Industry. In other company moves, **JACK CANTU** has been named vice president and director of the company. **GEORGE HORN** assumes the organization-wide responsibilities of director of marketing. New director of sales is **FRANK KOLLEY. JIM CONVERSE** becomes director of technical services. **GARY NEYMAN** has been named manager of technical information. **TOSH FUCHIGAMI** joins ProTurf as manager of technical field services. **BILL HOOPES** becomes senior PTI instructor of the company's retail division. **J. C. HIGGINS** moved to assistant general manager. **RAY FLEMING** becomes ProTurf's manager of field administrative services. **GEORGE GUMM** named manager of the midwestern region and **BRIAN FINGER** appointed manager of the eastern region. **ED DOTSON** promoted to manager of sod growers sales.

* * *

DONALD J. VALSVIK elected vice president of Conwed Corporation. He will continue to serve as manager of the developing business group.

Int. Pesticide Applicators Form Michigan Chapter

A Michigan chapter of the International Pesticide Applicators Association has just been formed according to an announcement by Lew Sefton, corporate secretary.

Charter members of the new chapter are: Al Ray,Wolverine Tree Care Co., Detroit; Frank Jasso, Jasso Tree Service, Clarkston; Paul King, West Side Forestry Service, Inc.; and Bob Olsen, Robert Olsen Landscape, Inc., Lapeer.

For more information about starting a state chapter of IPAA write: Lew Sefton, Corporate Secretary, International Pesticide Applicators Assocation, Inc., 5600 S. W. Rosewood, Lake Oswego, Oregon 97034.

Applicator Workshops To Be Held By B&G Company

Workshops designed to teach the applicator more about his business have been announced by the B & G Company, Dallas, Tex.

According to L. P. Quattrochi, general manager, each of the workshops is one and one-half days in length. The program is presented by means of a workbook which contains outlines of each talk. Delegates to the workshops will fill in the workbook which will act as a source of material later.

Dates and locations of the workshops are: Dallas Workshop, Ramada Inn, Carpenter Freeway, Irving, Tex., Jan. 11-12; Houston Workshop, Royal Coach Inn, South Boulevard, Houston, Tex., Jan. 18-19; Lubbock Workshop, KoKo Inn and KoKo Palace Convention Center, Lubbock, Tex., Feb. 8-9; and Oklahoma Workshop, 89er Motel, Oklahoma City, Oklahoma, Mar. 1-2.

Texas Turfgrass Conference Held on A&M Campus

About four hundred people attended the 28th annual Texas Turfgrass Conference in early December in the J. Earl Rudder Conference Center at Texas A&M University.

Dr. Richard H. Duble, associate professor in the Soil and Crop Sciences Department, said the conference was aimed at turf management on golf courses, parks, lawns and business areas.

Keynote address this year was presented by Dr. James R. Watson, vice-president of the Toro Company, Minneapolis, Minn.

Afternoon talks covered grass establishment, weed control in overseeding greens, golf course construction budgeting and bentgrass for Texas golf greens.

Other topics were athletic field maintenance, roadside turf establishment, recent advances in weed control, turf growth retardants and cultural problems of ornamental plants.

The second day's sessions focused on bermuda turf thatch control, Floratam, irrigation system installation and making golf courses competitive. Also included were personnel motivation, woody ornamentals, annual plant propagation and lake management.

Conference sponsors were the Texas A&M soil and crop sciences department, Texas Turfgrass Association and U.S. Golf Association, Green Section.

Zip-Penn Offers Catalogue

A new catalog of replacement chain saw chains, guide bars, sprockets, engine parts and other equipment for chain saws has been issued by Zip-Penn Inc. Write: Zip-Penn Catalog Office, Box 43073, Middletown, Ky. 40243.

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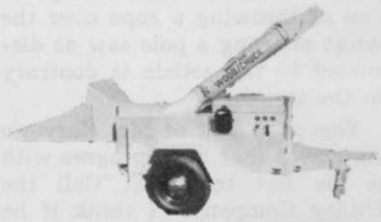

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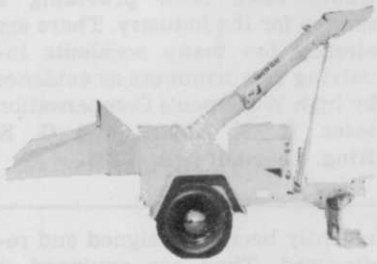

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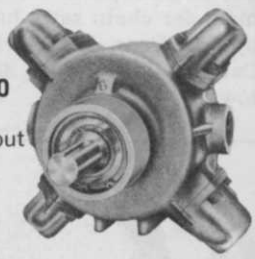

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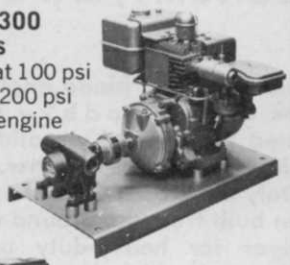

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LETTERS TO THE EDITOR

HATS "ON" TO US

Hard Hats & Tree Men . . . . . In my own company, I'm only the boss, and when I get up in the morning I put my plant on, then put my hard hat on my head. I feel it is the best insurance coverage possible for a treeman's head, and the company pays the $5 premium, but the policy only covers you when it covers you. Hard hats are good insurance.

Like your article in July issue on synthetic ropes says, most tree men resist change, but these hard headed souls would still be wise to get accustomed to wearing hard hats. Some of us here in Westchester have made it a condition of employment spelled out in the job application along with other safety rules. If a man is fired for violation of safety rules which are so part of the conditions of employment, in New York he cannot collect unemployment until he works another 14 weeks. Besides OSHA says THOU SHALL WEAR an approved hard hat whenever in the vicinity of any overhead hazard.

Maybe you can help editorially. I'd like to see hard hats worn a lot more often. Safety's Cheap! **John A. Crockett, vice president, Westchester County Tree Protective Association, Inc.**

JUST THE FACTS

You may construe this letter as fan mail. I am an ardent environmentalist, Sierra Club member, etc, etc, who, as a plant scientist receives selected publications . . . . I think you do an excellent job of presenting the new FDA and EPA ruling, pronouncements, etc. without using the usual wild, bitter comments . . . . Most of us realize that all chemical or all natural will not work, but emotion will not solve the problem either. We must continue to work together for the common good; not just the good of one side.

So, even if you have an almost uncontrollable urge to "blast out" when a new chemical is removed or restricted from use, just remember that you might lose a group of readers that really just want to help solve the problems, not obstruct for the sake of obstruction. **Fred R. Rickson, associate professor of botony, Oregon State University.**

OBJECTION SUSTAINED

Mr. Hank Harvey, Jr.'s article, "Arborist Shop Talk" in the October issue advocates a "limb-over-a-wire-technique." This very definitely is an unsafe practice. Use of this technique could result in the wires burning down injuring a person on the ground. Under certain conditions, conductor contact could cause a voltage increase thereby damaging televisions, refrigerators, appliances, etc.

The American National Standards Institute appointed a committee designated as Z133 to develop "Safety Requirements For Tree Pruning, Trimming, Removal and Repair." This standard was developed by representatives of industry, government, trade and educational groups, including U.S. Department of Labor and OSHA. Because of the hazards associated with the practices advocated by Mr. Harvey, we feel compelled to respond to his article.

This standard specifically identifies electrical hazards associated with tree work in Section 4, Section 8.2.1 and 8.2.5. The practice of throwing a rope over the wires or using a pole saw as discussed in the article is contrary to the standard.

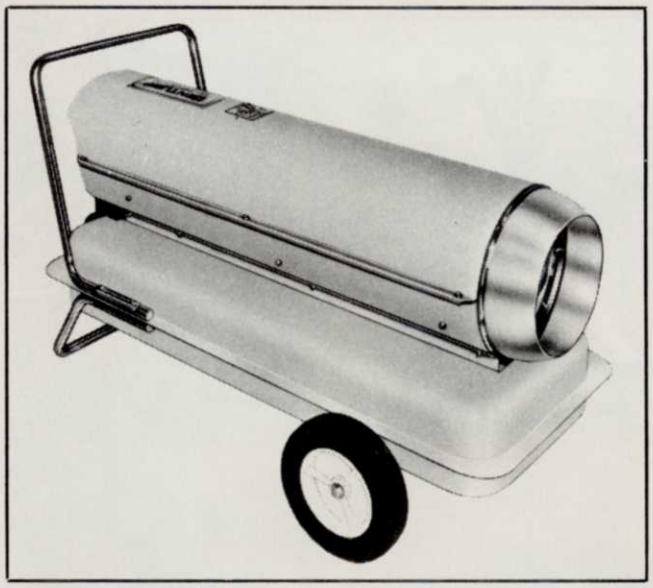
The only part of Mr. Harvey's statement that we can agree with is his last sentence, "Call the Utility Company." I think if he had said this in the beginning, he would have been providing a service for the industry. There are already too many accidents involving tree trimmers as evidence by high Workmen's Compensation rates. **R. E. Abbott and G. S. King, Co-chairmen, Z133.**

Lockwood-Hardie Sprayers Featured in New Brochure

A new brochure on the full line of Lockwood-Hardie sprayers is now available from the Lockwood Corporation, Gering, Nebraska.

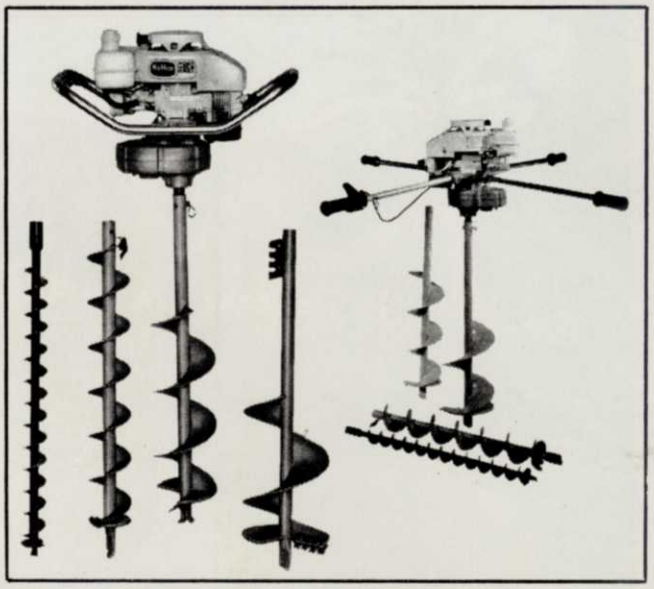
The complete line of sprayers has recently been re-designed and re-engineered. They are equipped with stainless steel tanks to prevent corrosion and lower maintenance cost.

For a copy of the Lockwood spraying brochure, write: Lockwood Corp., Dept. 119, Gering, Nebraska 69341.



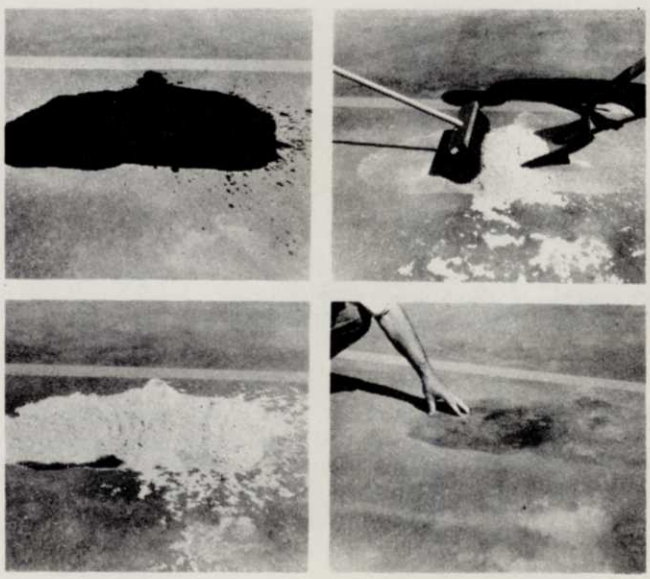
HIGH-PRESSURE HEATER: Century Engineering Corp., Farm Equip. Div., Cedar Rapids, Ia.

Here's a 155,000 BTU oil-fired, high-pressure portable heater that can take the chill off an area in a hurry. It has a 12 gallon fuel capacity that provides 12 hours of continuous heating. All you do is plug the heater in and set the thermostat. A high-pressure pump moves fuel from the tank to a valve which controls flow to the cumbustion chamber. A fan puts out 325 cubic feet of heated air per minute. For more details, circle (701) on the reply card.



POST HOLE DRILL: Hoffco Inc., Richmond, Indiana

Drills for post holes, earth or other uses are part of this line of machines. There a choice of one man-two cycle, two man-two cycle, or two man-four cycle models. Features include: heavy duty transmission fully equipped with precision ball bearing at all load points; centrifugal clutches with over-riding abilities for the protection of the operators and machines; anti-weep baffles on all fuel tanks; quick release throttle controls, and more. Low tone mufflers are used on all units which exceed all current, metropolitan anti-noise requirements. There a drill available to handle augers from two inches through eight inches. For more details, circle (702) on the reply card.



SPONGE-IT: Johns-Manville, Celite Div., Denver, Colo.

Water and oil spills on streets, driveways and work area floors can be lifted quickly with this new product. It's available in powder form. Tests have shown the powder to be more effective than commercial floor sweep due to its higher absorptive capacity and dryness of oil and powder mixture, according to the manufacturer. To remove oil spill, pour produce over spot and then sweep away powder and oil mixture. Oil is absorbed by powder and effectively removed from surface. For more details, circle (703) on the reply card.

FLEX-A-MATIC 140: Hahn, Inc., Evansville, Ind.

This five-gang reel mower is now available after four years of development and testing. It cuts a swath up to 12 feet and features five 30 inch wide variable speed heavy duty reels driven by mechanical cables. Other features include: finger-tip height of cut adjustment from ½ inch to 3½ inches; a break-away outboard real device; and reels positioned around traction wheels to avoid running over uncut grass. Unit has a short turning radius and high flotation tires. For more details, circle (704) on the reply card.

Photo by R. H. Bailey.

This green, sixteen miles east of Palm Springs, Calif., shows Penncross creeping bentgrass doing well in 113° temperature. Photo was taken June 26, 1973. Mel Curci, golf director of Indian Wells Country Club commented on that day, "113° in the shade and growing strong." Indian Wells Country Club is one of four sponsoring courses in the Desert Classic.

CREEPING BENTGRASS RESEARCH

Polycross Penncross "... the grass designed for golfers ..."

By W. SCOTT LAMB

THERE are many varieties of turfgrass being grown with an eye toward the golf trade. But, based on performance, none have come up to the reputation of Penncross Creeping Bentgrass.

Dr. Burt Musser and Dr. Joseph Duich, Pennsylvania State University developed the polycross bearing the Penncross name, by crossing three strains of creeping bentgrass for the express purpose of making a better bentgrass for golf greens. Their research spread through many lines of bentgrass before they developed the three-line cross with the qualities they were looking for in a putting green grass.

The parent lines developed by the researchers are kept in carefully maintained condition in Pennsylvania State University greenhouses. From these three varieties come stolons which are planted with great care by selected seed growers in Oregon.

The stolons are field-planted in rows, with the three components planted in separate rows so there are balanced populations throughout the field. The resulting cross pollination makes the polycross (3-plant crossing) throughout the field.

The process sounds simple enough, but the requirements for growing this certified seed are very rigid. No other plantings of bent can be grown near the Penncross, nor may other varieties of bentgrass be grown in the field for a number of years.

The fields are sanitized chemically to eliminate all growth of weeds or other grasses. The rows of stolons are hand planted and constantly patrolled through the early growing season to rogue weeds and unwanted grasses that may contaminate the field after planting.

Each field is registered for certification by the grower. Certification specialists from Oregon State University inspect each field to make sure it complies with planting regulations and to verify isolation from other plants which could cross pollinate.

Harvesting is carried out with immaculately clean combines and the seed is handled by lot number which indicates the field in which it was grown. Samples from the lot are taken by Oregon State University certification specialists to the official laboratory for careful inspection and

testing.

Oregon certification standards require 98% pure seed and 85% germination with minimum allowance for weed and crop seed. Penncross growers, through their association, have tightened these requirements even more. Putting green quality Penncross must meet the above standards plus be free of all objectionable weeds and crop seeds including Poa *annua*. This extra effort by the growers makes Penncross one of the purest turfgrass seeds available for putting greens.

Bentgrass seed is extremely small, with approximately 9-million seeds per pound. Since each seed produces a plant, the seeding rate for even new greens is light compared to larger turfgrass seeds sown on other areas of the golf course.

The general recommendation for seeding new greens is one to two pounds of seed per 1,000 square feet. For overseeding existing greens, one to one and a half pounds per thousand square feet is recommended. Rapid establishment of new greens is proven by letters from enthusiastic golf course superintendents who report newly seeded greens being in play from 60 to 90 days after seeding.

This bentgrass variety does receive scattered complaints from course superintendents who run into maintenance problems, such as the requirement for a tight mowing schedule. The hybrid qualities of Penncross require greater attention; brushing and verticutting are necessary to keep greens in top condition. When properly maintained, it will give that consistent texture required for true putting. The rapid growth also repairs the green from heavy traffic associated with today's courses.

The hybrid characteristics of Penncross testify to the ability of Penncross to crowd out Poa *annua* from greens. Where Poa is a problem, overseeding with this bentgrass on a regular program will indeed help. In fact, according to a letter from one golf course superintendent, it is the only cure he knows for ridding greens of Poa *annua*.

Penncross is deep rooted, a quality which must be considered in a golf green grass. This factor makes it both cold and heat tolerant. From the rigors of the Canadian and Alaska winters word comes to the Penncross Association that it came through in great shape. Conversely, a golf course superintendent in California reports an irrigation system breakdown for one week in over 100 degree weather and still the Penncross emerged with no visible harm.

The consistent demand for Penncross seed is evidence of its acceptance throughout the golf world and speaks well for this very special polycross developed by Dr. Musser and Dr. Duich. The Penncross Association has adopted the slogan, "the grass designed for golfers" and the reputation speaks well for that slogan.□

Fertile Tiller Increase Noted By Open Field Burning

Open field burning after harvest has helped control disease and weeds and produce better yields in grass seed crops in Oregon's Willamette Valley since the practice began in the mid-1940s.

How does the heat improve yield?

Oregon State University crop scientists, working with red fescue, have found part of the answer. The answer is important because Willamette Valley growers, who produce 70 percent of the U.S. supply of red fescue and a large part of the world's supply of other grass seed, face a January 1975 deadline. That is when open field burning is scheduled to be banned in Oregon because of air pollution problems.

Dr. David O. Chilcote, OSU crop physiologist, recently reported on the red fescue results at the annual meeting of the American Society of Agronomy.

"The primary response to post-harvest residue burning was an increase in the number of fertile tillers (panicles)," he said.

"Not surprising is that competition for sunlight in the fall is one of the keys to plant growth and yield. With field burning, the plant does not elongate, seeking the sunlight. The shorter plant has more tillers in the fall and the tillers produce more seed heads in the spring."

In tests conducted by graduate student Phillip C. Stanwood, plants in a burned area produced 16 tillers per 10 primary shoots in the fall. The rate for the unburned area was one tiller per 10 primary shoots.

"Contrary to the belief that burning causes a shock in plants which stimulates growth, we found that burning, in addition to opening up the stand of plants, also exposes the soil more, so the plant roots and shoots experience a wider range of temperature each day." Chilcote said. This may favor floral induction.

Red fescue was picked for the plot experiments because it is particularly sensitive to burning in terms of seed yield. Similar results were produced in more limited tests with tall fescue, perennial ryegrass, bentgrass and bluegrass.

The importance of sunlight was established by shading burned and unburned plots through the winter. The shade, acting much like stubble left in an unburned field, stopped seed production.

"Our evidence points to light competition as being problably the most important single factor related to crop response and post harvest burning," said Chilcote.

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—insect report—

TURF INSECTS

CINCH BUG

(Blissus leucopterus leucopterus)

MARYLAND: Several heavy infestations in turf reported by homeowners in Baltimore, Prince Georges, and Montgomery Counties. Commercial acreage also treated in several areas.

GRASSHOPPERS

KENTUCKY: Adults and nymphs of various species averaged 80 per 100 sweeps in Shelby County roadside grasses, mostly of fescue.

FALL ARMYWORM

(Spodoptera frugiperda)

TEXAS: Increased activity noted on lawns in several south-central counties. Damaged St. Augustine lawns in Llano County. OKLAHOMA: Still heavy in lawns in Tillman County. ARKANSAS: New generation present in many pasture areas. This generation in same localized area as previous generations. Still problem and required treatment to pastures in State. MISSOURI: Larvae moderate to heavy, 1-25 per square foot, on fescue, orchard grass, and brome pastures throughout south-central and southwest areas. Damage mostly in new stands. TENNESSEE: Heavy on newly sown grasses in Greene, Knox, Jefferson, Sevier, Loudon, Monroe, and Roane Counties. Treatments applied. MISSISSIPPI: Still heavy and damaging to permanent and temporary pastures in southern areas. KANSAS: Second in-star larvae averaged 2 per row foot in drilled 5-inch fescue in Cherokee County.

INSECTS OF ORNAMENTALS

WHITEMARKED TUSSOCK MOTH

(Hemerocampa leucostigma)

OHIO: Larvae severely defoliated group of *Potentilla fruticosa* (bush cinquefoil) shrubs in Pickaway County. Defoliation complete on several small sweet gum trees in Wayne County. Larvae had been heavily parasitized by 3 wasps in both areas.

POPLAR TENTMAKER

(Ichthyura inclusa)

WEST VIRGINIA: Larvae caused 25-percent defoliation to several willow trees in Calhoun County. This is a new county record.

TREE INSECTS

NANTUCKET PINE TIP MOTH

(Rhyacionia frustrana)

VIRGINIA: Widespread and more severe than usual throughout Portsmouth area.

YELLOWNECKED CATERPILLAR

(Datana ministra)

TENNESSEE: Larvae defoliated oak trees in Henry, Madison, and Shelby Counties. Populations heavy; due to lateness of season, only slight damage expected. ALABAMA: Larvae, 100+ per tree, partially defoliated numerous oak trees on lawns and along highways in Montgomery, Butler, Geneva, Crenshaw, Lee, and other counties.

VARIABLE OAKLEAF CATERPILLAR

(Heterocampa manteo)

NORTH DAKOTA: Completely defoliated birch trees currently evident in the Killdeer Mountains in Dunn County. Very little defoliation noted in August. Some mature larvae still present. Defoliated birch trees also noted north of Grassy Butte in McKenzie County. KANSAS: Defoliated some oak trees in Sedgwick County and caused light defoliation of oaks at Topeka, Shawnee County. Growth stages in Topeka included eggs and larvae up to half grown.

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For More Details On Following Page Circle (134) On Reply Card

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meeting dates

Kansas State Shade Tree Conference and Kansas Arborist's Association, Student Union, Kansas State University, Manhattan, Kan., Jan. 3-4.

Western Association of Nurserymen, trade show and 84th annual meeting, Plaza Inn, Kansas City, Mo., Jan. 6-8.

Tennessee Turfgrass Association, annual conference, Roger Millers King of the Road Motor Inn, Nashville, Tenn., Jan. 7-8.

Mid-Atlantic Golf Course Superintendents Association, 45th annual conference, Sheraton-Lanham Beltway Convention Center, 8500 Annapolis Road, New Carrolton, Md., Jan. 7-8.

New England Chapter, International Shade Tree Conference, annual meeting, Highpoint Motor Inn, Chicopee, Mass., Jan. 8-9.

Northeast Weed Science Society, annual meeting, Holiday Inn, 18th & Market St., Philadelphia, Pa., Jan. 8-10.

Michigan State University-Michigan Pesticide Association, weed workshop, MSU campus, East Lansing, Mich., Jan. 9-10.

New York State Arborist Association, annual convention, Raleigh Hotel, So. Fallsburg, N.Y., Jan. 13-16.

Michigan Turfgrass Conference, 44th annual, Kellogg Center, Michigan State University, East Lansing, Mich., Jan. 15-16.

Michigan Turfgrass Conference, 44th annual, The Kellogg Center for Continuing Education, Michigan State University, East Lansing, Mich., Jan. 15-16.

New Hampshire Turf Seminar, Sheraton Wayfarer Motor Inn, Bedford, N.H., Jan. 17-18.

California Weed Conference, Woodlake Inn, Sacramento, Calif., Jan. 21-23.

University of Tennessee, Winter Short Course in Turf Management, University of Tennessee Plant Sciences Building, Knoxville, Tenn., Jan. 21-25.

Southern Weed Science Society, Sheraton Biltmore Hotel, Atlanta, Ga., Jan. 22-24.

Rocky Mountain Regional Turfgrass Conference, 20th annual, Colorado State University, Fort Collins, Colo., Jan. 24-25.

Ohio Chapter, International Shade Tree Conference, annual meeting, Sheraton Columbus Hotel, Columbus, Ohio, Jan. 27-28.

Ohio State University Short Course, 45th annual, for arborists, turf management specialists, landscape contractors, garden center operators and nurserymen, Sheraton Columbus Hotel, Columbus, Ohio, Jan. 27-31.

Associated Landscape Contractors of America, 12th annual meeting, Hilton Palacio Del Rio, San Antonio, Tex., Jan. 28-Feb. 1.

Penn State Turfgrass Conference, Keller Conference Center, Campus, University Park, Pa., Jan. 28-Feb. 1.

Winter Seminar for Commercial Arborists, Illinois Commercial Arborists Association and the extension service, University of Illinois, Sheraton O'Hare, Rosemont, Ill., Jan. 29.

Virginia Turfgrass Conference, Sheraton Motor Inn, Fredricksburg, Va., Jan. 29-30.

Northern California Turfgrass & Environmental Landscape Exposition, 10th annual, San Mateo County Fairgrounds, San Mateo, Calif., Jan. 30-31.

Golf and Fine Turf, Three-Day Turf Course, Rutgers University, New Brunswick, N.J., Jan. 30-Feb. 1.

Penn-Del Chapter, International Shade Tree Conference, annual meeting, Marriott Motor Inn, Philadelphia, Pa., Jan. 31-Feb. 1.

Nebraska Aviation Trades Association, agricultural seminar, Norfolk, Nebr., Feb. 5-8.

Midwestern Chapter, International Shade Tree Conference, annual meeting, Stouffer's River Front Inn, St. Louis, Mo., Feb. 5-7.

American Sod Producers Association, winter conference, Ramade Bourbon Orleans, New Orleans, La., Feb. 7-8.

Golf Course Superintendents Association of America, 45th International Turfgrass Conference and Show, Anaheim Convention Center, Anaheim, Calif., Feb. 10-15.

American Society of Consulting Arborists, 8th annual, International Inn, Tampa, Fla., Feb. 14-16.

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National Arborist Association, 36th annual meeting, International Inn, Tampa, Fla., Feb. 17-21.

Wisconsin Arborist Association, annual convention, Wausau, Wisc., Feb. 20-21. Contact Jerry Koch, city forester, Courthouse, Wausa, Wisc. for details.

Shade Tree Disease and Insect Short Course, 17th annual, Iowa State University, Ames, Ia., Feb. 20-22. Contact Dr. A. H. Epstein, dept. of botany and plant path., Ia. State Univ. for details.

Park, Recreation and Environment Design, National Symposium, Carleton House, Orlando, Fla., Feb. 25-28.

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COMING NEXT MONTH . . .

SPECIAL SECTION

TURF VEHICLE CARE

Urban Pesticide Dealer And Applicator Clinics Dates Set

Pesticide use recommendations, as well as pesticide regulations, change from year to year and dealers and applicators are hard-pressed to keep up-to-date.

But Illinois "small package" dealers and applicators can get the latest in pest control information and recommendations at any one of 10 Urban Pesticide Dealers and Applicators Clinics, scheduled during January, at locations throughout Illinois.

The clinics are sponsored jointly by the University of Illinois cooperative extension service and the Illinois department of agriculture, division of plant industry.

The sessions at each clinic will provide information for dealers and applicators who sell or apply home, yard or garden pesticides and for custom applicators and operators who apply pesticides to non-agricultural areas, such as parks, highways, golf courses and similar areas.

Some of the scheduled session topics are: "Weed Pests in Turfgrass and Other Crop Areas;" "Calibrating Pesticide Application Equipment;" "Insect Pests of Trees, Shrubs and Lawn Areas and Their Control;" "The New Federal Environmental Pesticide Control Act;" and "Controlling Weeds On Roadsides, Ditches and Other Non-Crop Areas."

A representative of the Illinois State Department of Agriculture will administer the examinations for custom-spray applicator and operator licenses at the end of each clinic for those wishing to take the exam.

The following are dates and locations for the 1974 clinics: January 14, Rantoul, Redwood Inn; January 15, Peoria, Heritage House, Rt. 88 North; January 16, Springfield, Heritage House, Rt. 66 South; January 17, Belleville, Augustines, Rt. 460 & Rt. 158; January 18, Marion, Holiday Inn, I-57 & Rt. 13; January 21, LaSalle-Peru, Holiday Inn, I-80 & Rt. 51; January 22, Rockford, Howard Johnson, Rt. 51 South; January 23, Rock Island-Davenport, Holiday Inn, Davenport, Iowa; January 24, Des Plaines, Seven Eagles Restaurant; January 25, Joliet, Holiday Inn—South.

Because of the anticipated large enrollment, advance registration is required for the clinics at Des Plaines and Rock Island-Davenport. Dealers and applicators who plan to attend the clinic at Des Plaines should contact James Fizzell, Cook County associate extension adviser, Room 3, 622 Graceland Avenue, Des Plaines, Illinois 60016. Those planning to attend the Rock Island-Davenport meeting should contact J. E. Kenney, Rock Island extension adviser, 1188 Coaltown Road, East Moline, Illinois 61244.

New England Chapter, ISTC Plans 10th Anniversary

The New England Chapter, International Shade Tree Conference, will hold their 10th annual meeting at the High Point Motor Inn, Chicopee, Mass. Jan. 8-9.

According to Erik H. Haupt, president, this year's meeting will feature an in-depth look at disease and insect control of shade trees, as well as a presentation on tree wounds.

Dr. Francis Holmes will discuss Benlate benomyl fungicide as it relates to Dutch Elm Disease. Professor Clifford Chater will present a forecast for 1974 about insect pest infestations. Dr. Alex Shigo of the Northeastern Forest Experiment Station will review some of the work being done on tree wounds.

The New England Chapter annual business meeting will commemorate the 10th anniversary of the chapter. Dinner speaker at the annual banquet will be John Hansel, director, Elm Research Institute and the Harvard Elm Project.

On the second day, Prof. Gordon King, chairman, ANSI Z133 committee will discuss new regulations for tree care companies.

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WSSA Meeting Scheduled For Las Vegas Feb. 12-14

A varied, informative program and all the entertainment the "Convention Capital of the World" can offer are both set to welcome those attending the annual meeting of the Weed Science Society of America.

The meeting is set for Las Vegas' famous Caesar's Palace on February 12-14.

A special feature of this year's session will be the initial meeting of the new Turf and Ornamentals Section of the Society. A program organized by Chairman Al Turgeon will be presented.

The meeting this year promises to be of value to a wider audience than ever — including researchers, extension personnel, and agri-businessmen. Special emphasis panels featuring outstanding speakers have been set up to provide information for these groups with a need for a particular kind of knowledge about the industry and science of weed control.

Featured speakers will include Dr. Hans Gysin of Ciba-Geigy Corporation, Basle, Switzerland, who will speak on international weed control problems; Dr. James R. Hay of the Regina Saskatchewan Research Station speaking on "Gains to the Grower from Weed Science"; Dr. W. A. Harvey, University of California, on challenges ahead in weed science.

Keynote speaker is Secretary of Agriculture Earl L. Butz.

Panels will discuss the state of integrated pest management, biological control of weeds, and pesticide safety. R. C. Ferguson, executive secretary of the National Agricultural Marketing Association, will also be a speaker during Wednesday's industry session.

Rounding off the meeting are other presentations on aquatic weed control, teaching and extension work, as well as a full program featuring some 60 papers on physiology.

In all, more than 500 papers by 250 different authors will be presented.

This year's session will be open to more interested persons than ever before through a new associate WSSA membership now available. The new classification is designed for anyone interested in weed science — chemical dealers or distributors, custom applicators, grounds maintenance managers, agri-fieldmen, regulatory officials, extension agents, farm managers and others. Dues for the associate membership are $10.

— classifieds —

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: "Position Wanted" 10¢ per word, minimum $3.00. All other classifications 20¢ per word, minimum $4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Boldface rule box: $25.00 per column inch.

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WANTED chief groundskeeper for corporate headquarters. 125 acre site with 3.6 acre lake. Located in midwest area. Applicant must have approximately 3 years in landscape maintenance of parks, school, golf course or industrial complex and supervisory experience. Annual salary plus bonus and benefits. Send resume to Box 107, Weeds, Trees and Turf, 9800 Detroit Avenue, Cleveland, Ohio 44102.

RESPONSIBLE and established turf distributor desires representation in Detroit and Indiana markets. Our present sales personnel average $20,000.00 plus car and expenses. Knowledge of industry a necessity; sales experience helpful. All replies held in strictest confidence. Write Box 108, Weeds, Trees & Turf, 9800 Detroit Avenue, Cleveland, Ohio 44102

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LANDSCAPE ARCHITECT AND/ or designer; degree with experience. Firm involved in park planning, need personnel with skills in working drawings of site and landscape development. Send resume to Wukasch & Assoc., Architects and Engineers, P.O. Box 7788, Austin, Texas 78712. 512 476-0571

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trimmings

AFTER BUILDING the largest, most advanced industrial machine in the history of the world for the purpose of the betterment of human life, we now realize that the uncontrolled wastes from our society and our material progress are destroying some of that quality of life we hoped to better," said John R. Quarles, Jr., deputy administrator of EPA. "This is the supreme irony (of the energy crisis)."

SOME 82 PERCENT of all workers in this country now commute to their jobs by car — and more than two-thirds of them drive alone," says Norbert T. Tiemann, Federal Highway Administrator. ". . . . Obviously, since the only region with a present capability to meet our growing oil needs is the Middle East, we must expect sharply increasing prices, as well as increasing difficulties in securing adequate oil supplies. It is a sobering thought that more than 40 percent of this country's total oil usage must be imported — and that this percentage will continue to rise as U.S. oil production continues to decline.

"We must immediately start to reduce consumption — there is no alternative. And the private automobile is a necessary target. We must get people out of their own cars — particularly during the rush hours — and into car pools or mass transit facilities."

Tiemann said nothing about reducing the number of trucks on the highways by placing their cargos on railroads. Nor did he suggest alternatives to the biggest fuel guzzlers, airplanes.

HOW MANY GOLF COURSES are in the Carolinas? According to the Carolinas Golf Course Superintendents Association, there are 227 either 9 or 18 hole courses who responded to a recent survey. Yet this is an increase of 62 courses since the last survey in 1967. Dr. Carl Blake, North Carolina State University, estimates there are over 400 courses in North Carolina alone.

GEORGE TOMA, groundskeeper at Arrowhead Stadium in Kansas City and a consultant for a KC based trade magazine, shares this experience with those of the Green Industry. Earlier this fall a full can of ammonia, used to remove paint from stadium astroturf, exploded in his face. According to the Kansas City Star, George said, "It was stupid. I told the kids to be careful with this ammonia. We use ammonia-base paint on the field and it takes this 100 percent ammonia to get it off each week. We've had some of the pumps rupture before, but usually with the paint in them. They would blow maybe 20 feet in the air. So we don't let the kids work with it."

Toma's advice is to hold the cans to the side when pumping. "But this time I was pumping it right in front of me, between my legs. I was looking out on the field to see where I would spray the stuff when it ruptured and hit me right in the eyes," he told the city newspaper.

He's back on the job now, but he still shudders when he thinks about the experience. It could have left this professional blind.

MAN SHOULD NOT RELY on a single method to control a given plant disease, says Prof. Kenneth F. Baker, a plant pathologist at the University of California, Berkeley. Citing host resistance, proper cultivation practices, use of planting stock free of disease organisms, chemical treatments and biological controls as means of combatting plant disease, he said that "each works best at different times and places, and they compensate for each other's deficiencies. Man has tended to emphasize the single-shot overkill control procedure, and perhaps we pathologists have developed a one-to-one syndrome that further diminishes our options."

He said that man has greatly intensified the disease potential of microorganisms by decreasing host resistance, by providing large areas of a single crop, by producing an exceptionally favorable physical environment, and by reducing or destroying the natural microorganism balance.

Under natural long-term changes, the soil microorganisms have time to adjust, but man disturbs this situation by his abrupt and violent alterations, thus reducing or destroying the very basis of dynamic stability in the ecosystem. ". . . The greater the imbalance, the more severe a disease is apt to be," he said.

Checklist For Jumping Your Battery

If you're forced to jump your battery because it doesn't have enough zing this winter, take a few tips from W. E. Stuckey, extension leader, safety at Ohio State University. Carelessness in handling jump cables can cause a battery to explode. Even a good battery can explode, and the frozen one runs the greatest risk.

Although a rare occurrence, the most frequent cause for explosion is a nearby flame or spark, he says. The most frequent cause of spark is the misuse or wrong procedure of attaching jump cables. Here's a checklist:

1. Be sure both batteries are of the same rated voltage, 12 volt to 12 volt, etc.
2. Both batteries must be negative-ground systems.
3. If the "dead" battery is frozen, STOP! Find an alternative way to start the engine.
4. Bring the two vehicles together, but not touching. Set brakes and keep both vehicles out of gear. Keep booster car's engine running.
5. Remove the well caps on both batteries and cover the wells with cloth. Double check for icing or dry wells.
6. Locate positive (+) terminal on each battery. Connect one cable clip to the positive terminal on the operating battery and the other end of the same cable to the positive terminal on the dead battery. Positive to positive.
7. Connect one clip of the other cable to the negative (−) terminal of the operating battery. Connect the other clip to the dead vehicle's frame at least 12 inches away from the battery. *(This is not the usual advice, but it is safer than running the risk of an explosion. Sparks, if any, will be away from the danger spot.)*
8. Start the dead vehicle's engine.
9. When engine is running, disconnect the two cables in exactly the reverse order from that used in connecting them.
10. Replace well caps.

For More Details On Following Page Circle (177) On Reply Card ▶

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Before selecting an automatic irrigation system, consider the viewpoint of a blade of grass. It wants to see enough water coming its way often enough to keep it healthy. How much and how often depends on such variables as growing conditions, sun and shade, height, temperature, and course contour. That's why the happiest sight a blade of grass can see is a member of Rain Bird's exclusive Golf Team (six full time golf irrigation experts) consulting with a Rain Bird installer and the superintendent—right on the course. It means the best irrigation plan, tailored to your course, carried out with the most reliable equipment. Ask anyone with a Rain Bird system. Ask any blade of grass.

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